EXPRESS5800/120Rd-2

User's Guide

EXPRESS5800/120Rd-2

User's Guide

Proprietary Notice and Liability Disclaimer

The information disclosed in this document, including all designs and related materials, is the valuable property of NEC Computers Inc. and/or its licensors. NEC Computers Inc. and/or its licensors, as appropriate, reserve all patent, copyright and other proprietary rights to this document, including all design, manufacturing, reproduction, use, and sales rights thereto, except to the extent said rights are expressly granted to others.

The NEC Computers Inc. product(s) discussed in this document are warranted in accordance with the terms of the Warranty Statement accompanying each product. However, actual performance of each such product is dependent upon factors such as system configuration, customer data, and operator control. Since implementation by customers of each product may vary, the suitability of specific product configurations and applications must be determined by the customer and is not warranted by NEC Computers Inc.

To allow for design and specification improvements, the information in this document is subject to change at any time, without notice. Reproduction of this document or portions thereof without prior written approval of NEC Computers Inc. is prohibited.

Trademarks

Adobe, and Adobe Acrobat are registered trademarks of Adobe Systems, Incorporated.

Microsoft, Microsoft Windows, Windows NT, Windows 95, Windows 98 and Windows 2000 are all registered trademarks of Microsoft Corporation.

MS-DOS is a registered trademark of Microsoft Corporation.

Pentium is a registered trademark of Intel Corporation.

All other product, brand, or trade names used in this publication are the trademarks or registered trademarks of their respective trademark owners.

PN: 456-01582-000 **January 2002**

Copyright 2002
NEC Computers Inc.
15 Business Park Way
Sacramento, CA 95828
All Rights Reserved

CONTENTS

Using This Guide vii
Text Conventions viii
Safety Indications and Symbols viii
Related Documents ix
Safety Notices x
Care and Handling xii

1. System Overview

Overview 1-2
Front View with Front Bezel Closed 1-3
Front View with Front Bezel Removed 1-4
Rear View 1-6
Internal View 1-8
System Board 1-9
Status Indicators 1-10
POWER Lamp 1-10
STATUS Lamp 1-10
DISK ACCESS Lamp 1-12
ACT Lamp 1-12
Disk access Lamp 1-12
Hard Disk Lamp 1-13
LAN Connector Lamps 1-14
AC POWER Lamp 1-15
Standard Features 1-16
Power Supplies 1-17
Peripheral Bays 1-17
SAF-TE Logic 1-18
System Board Features 1-18
Processor 1-18
Memory 1-18
PCI Riser Slots 1-19
Video 1-19
SCSI Controller 1-19
Network Controller 1-20
Network Teaming Features 1-21
Keyboard and Mouse 1-23
RJ-45 Serial Port 1-23
ACPI 1-23
System Board Management Controller (BMC) 1-24
Degradation Feature 1-25
Remote Power-On Feature (Wake On LAN) 1-25
AC-LINK Feature 1-25
System Security 1-26
Security with Mechanical Locks and Monitoring 1-26
Software Locks via the BIOS Setup Utility 1-26
EXPRESSBUILDER 1-30
NEC ESMPRO 1-31
Off-line Maintenance Utility 1-31
System Diagnostic Utility 1-31
NEC Management Workstation Application (NEC MWA) 1-31
Using Your Server 1-32
Front Bezel 1-32
POWER Switch 1-34

Identification of Servers ~ UID Switch ~ 1-39
Floppy Disk Drive 1-40
CD-ROM Drive 1-41

2 Setting Up Your Server

Setup Flow 2-2
Selecting a Server Site 2-3
Installation 2-3
Installation of a Rack 2-3
Unpacking the System 2-5
Assembling the Rack-mount System 2-6
Restricted Access Location 2-7
ESD Precaution 2-7
Checking Components 2-7
Required Tools 2-7
Rack Installation Procedure 2-8
Removing the Server from the Rack Assembly 2-14
Connecting Peripheral Devices 2-16
Connection to Serial Ports 2-18
Connecting the Power Cord 2-19
Turning On the Server 2-21
Installing the Operating System 2-24
Installing Utilities 2-24
Making Backup Copies of System Information 2-25

3 Configuring Your System

System BIOS ~ SETUP ~ 3-1
Starting the SETUP Utility 3-2
Description of On-Screen Items and Key Usage 3-3
Configuration Examples 3-4
Menu and Parameter Descriptions 3-9
SCSI BIOS ~ SCSI*Select* ~ 3-31
Using the SCSI*Select* Utility 3-31
Configuring the SCSI Controller on Mother Board 3-31
Configuring the SCSI Controller on Optional Board 3-40
Configuring System Board Jumpers 3-41

4 Installing the Operating System

About Express Setup 4-2
Microsoft Windows 2000 4-4
Installation Notice 4-4
Flow of Setup 4-8
Installing and Configuring Device Drivers 4-13
Setup for Problem Resolution 4-16
Installing Maintenance Utilities 4-19
Updating the System - Applying Service Pack - 4-20
Making Backup Copies of System Information 4-20
Microsoft Windows NT 4.0 4-21
Installation Notice 4-21
Flow of Setup 4-24
Installing Windows NT 4.0 4-25
Installing and Setting Device Drivers 4-29
Setup for Problem Resolution 4-31
Installing Maintenance Utilities 4-36

Updating the System - Applying Service Pack - 4-36
Making Backup Copies of System Information 4-37
Novell NetWare 5.0 4-38
Required Diskettes 4-38
Installation Assumption....4-38
Preparation 4-39
Installing the Novell NetWare v5.0 Network Operating System....4-43
Restarting the Server 4-45
Backing Up the Server....4-45
Novell NetWare 5.0X....4-46
Required Diskettes....4-46
Preparation 4-47
Installing Optional Hardware 4-48
Installing and Configuring System Software....4-49

5 Maintenance

Making Backup Copies....5-1
Cleaning....5-2
Cleaning the Server 5-3
Cleaning the Interior....5-4
Cleaning the Keyboard/Mouse 5-5
Cleaning CD-ROM....5-6
System Diagnostics....5-7
Test Items 5-7
Starting and Ending the System Diagnostics....5-8
Relocating/Storing the Server 5-10

6 Troubleshooting

System Viewers....6-2
LEDs....6-2
Error Messages 6-3
Error Messages after Power-on 6-3
POST Error Messages 6-4
Beep Codes....6-9
Solving Problems....6-10
Problems with the Server....6-10
Problems with EXPRESSBUILDER....6-19
Problems with Express Setup 6-20
Error Message during Disk Array Configuration 6-25
Problems with Master Control Menu 6-25
Problems with Configuration Diskette Creator 6-26
Saving the Event Log File....6-27
Windows 2000....6-27
Windows NT 4.0 6-28
Saving system Configuration Information....6-29
Windows 2000....6-29
Windows NT 4.0 6-29
Saving Dr. Watson Diagnostic Information 6-30
Memory Dump....6-30
Preparing for Memory Dumping....6-30
Saving the Dump File....6-31
Backup IPMI Information 6-32
Recovery for Windows 2000/Windows NT System 6-33
Off-Line Maintenance Utility 6-38
Starting the Off-line Maintenance Utility....6-39

Features of the Off-line Maintenance Utility 6-40
Resetting the Server 6-41
Forced Shutdown 6-41

7 Upgrading Your Server

Safety Notes 7-2
Anti-static Measures 7-3
Preparing for Installation and Removal 7-4
Confirmation after Installation/Removal 7-5
Device Installation or Removal Procedure 7-6
Hard Disk Drive 7-6
Power Supply Unit 7-17
Server ~ Pull-out from the Rack ~ 7-21
Top Cover 7-22
DIMMS 7-24
Processor (CPU) 7-29
PCI Board 7-38
Disk Array Controller Board 7-46
Backup Device 7-53

A Specifications

B Interrupt Requests

C Installing and Configuring Windows 2000 and Windows NT 4.0

Windows 2000 ..... C-1
Device Drivers C-1
Installation Assumption C-2
Preparation C-3
Installing Microsoft Windows® 2000 Operating System C-4
Installing LAN Adapters C-5
Driver Installation for the ATI RAGE XL Display Adapter C-5
Windows NT 4.0 ..... C-6
Device Drivers C-6
Configuring RAID C-7
Installing Microsoft Windows® NT 4.0 Operating System C-7
Installing LAN Adapter Drivers C-8
Driver Installation for the ATI RAGE XL Display Adapter C-9

D Product Configuration Record Table

Hardware D-1
Software D-3

Glossary

Chapter 1

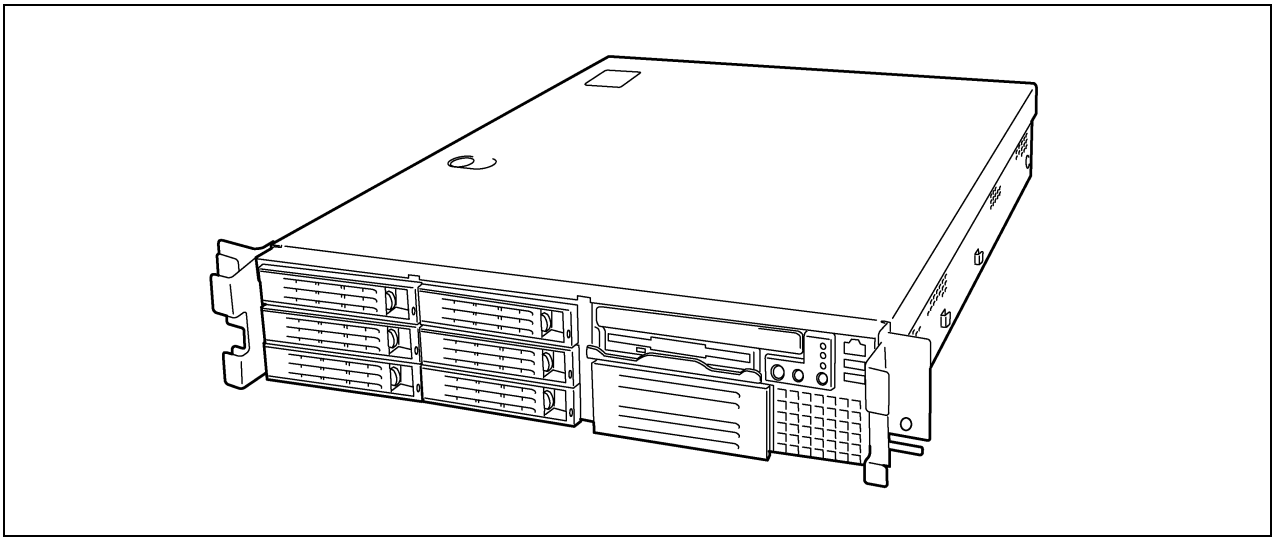
System Overview

The “System Overview” chapter provides the information necessary to use your server, and includes a description of your system’s major components and functions. Read this chapter to familiarize yourself with your server.

OVERVIEW

Your server is a modular multiprocessing server based on the Intel® Pentium® III microprocessor. It is a solid performer utilizing the latest technology. The combination of compute performance, memory capacity, and integrated I/O provides a high performance environment for many server market applications. These range from large corporations supporting remote offices to small companies looking to obtain basic connectivity capability such as file and print services, e-mail, and web access.

Your server is housed and available as a rack-mount system. Your server conveniently installs into a standard EIA 19-inch rack assembly.



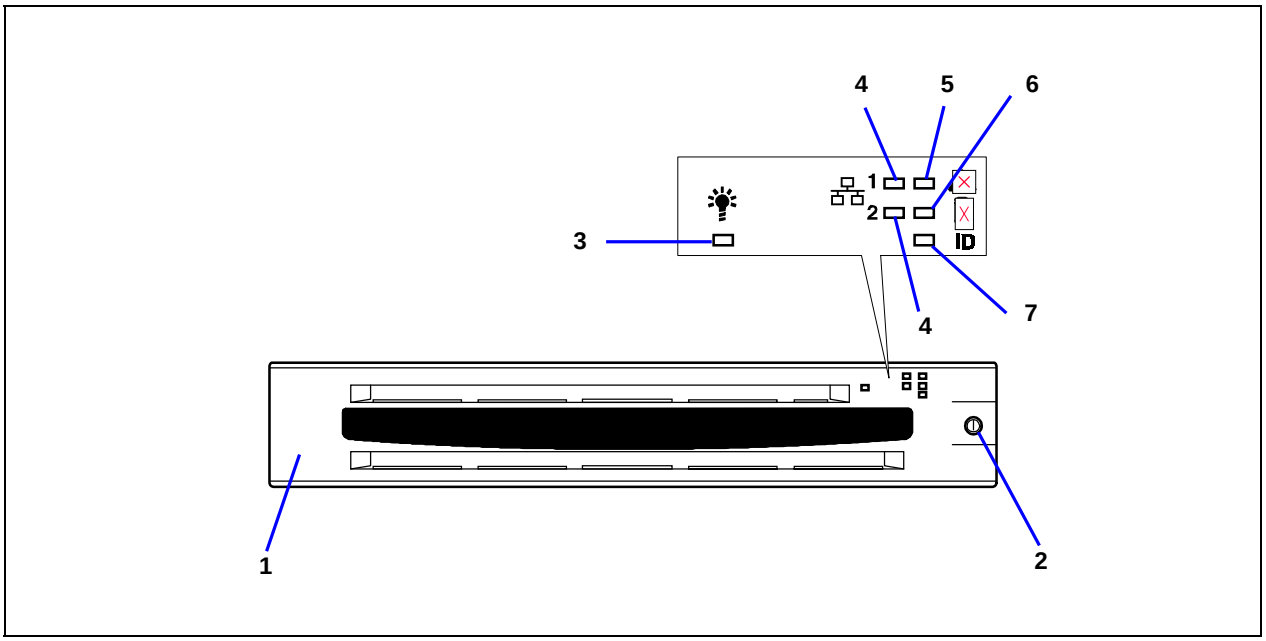
Your server includes a 3.5-inch diskette drive, a CD-ROM drive, six hot-swap SCSI hard disk drive bays, and a removable media device bay. The hot-swap SCSI hard disk drive bays support up to seven 1.0-inch SCSI hard disk drives that can be swapped in or out of the system without powering it down, if RAID functionality is configured in the system.

Alternately, your server can be configured to include a 7th SCSI hard disk drive. This configuration includes a removable media drive bay and seven hot-swap SCSI hard disk drive bays. The removable media drive bay may be used for installation of a high-speed tape drive.

As application requirements increase, you can expand your server with an additional processor, additional memory, add-in boards and peripheral devices: tape devices, CD-ROM, and hard disk drives.

Front View with Front Bezel Closed

The following figure shows the location of the front system features viewable with the front bezel closed.



1 Front bezel

The front bezel is a cover protecting the front devices during daily operation. A security key is provided to lock the cover.

2 Key slot

Insert the security key into this slot when unlocking the front bezel.

3 POWER lamp (green)

This lamp turns green when the power is turned on.

4 ACT lamp (green)

This lamp is on while the system is connected to the network. The number "1" on the icon indicates LAN port 1, and the number "2" indicates LAN port 2.

5 STATUS lamp (green/amber) (on the front panel)

This lamp indicates the server status. The lamp is green during normal operation. The lamp turns amber or flashes when the server enters an abnormal state.

6 DISK ACCESS lamp (green/amber)

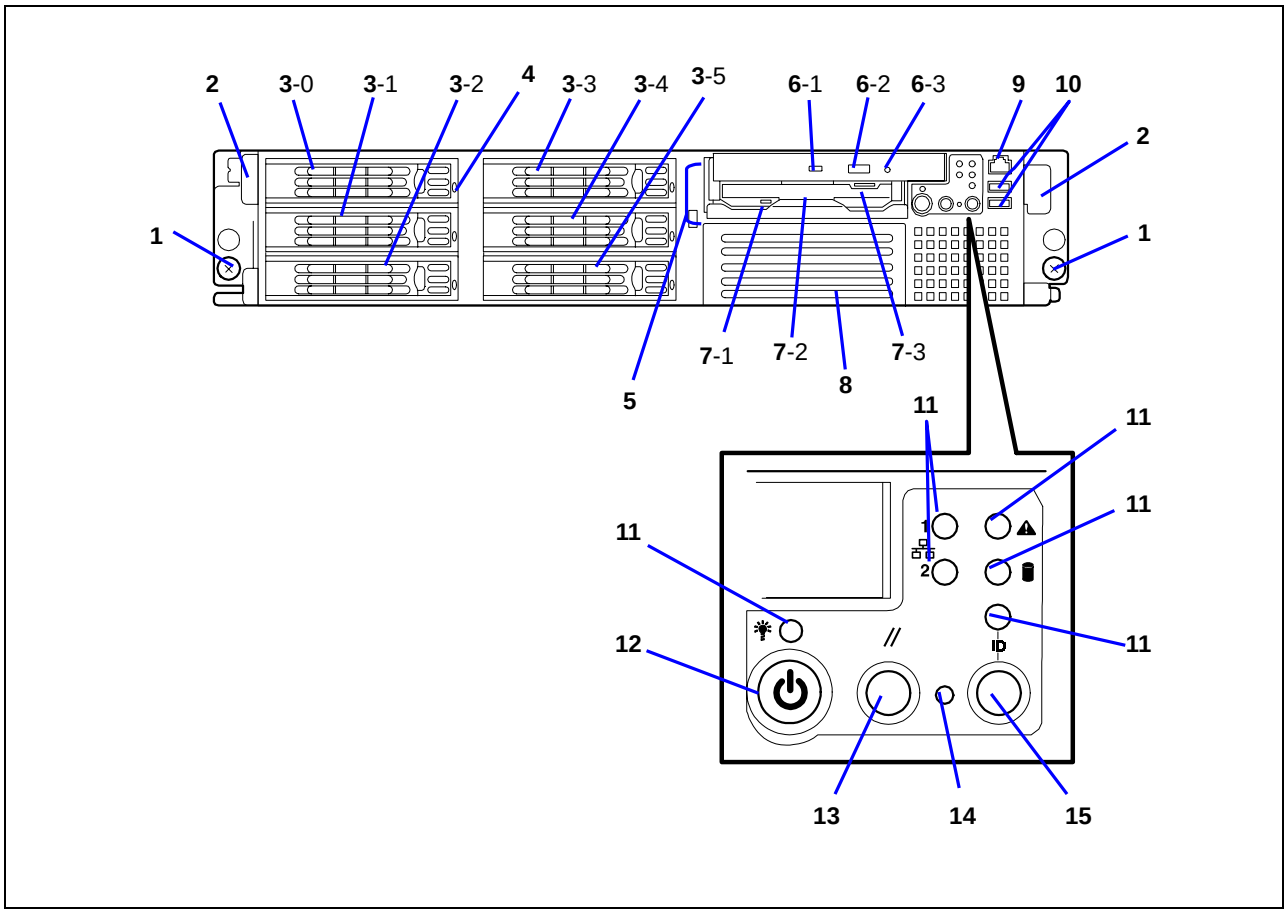
This lamp is green during access to the internal hard disks. The lamp turns amber if any one of the internal hard disk drives fail.

7 UID (Unit Identification) lamp (blue)

This lamp goes on when the UID switch is pressed. (The lamp also goes on when software issues a command.)

Front View with Front Bezel Removed

The following figure shows the location of the front system features viewable with the front bezel removed.



1 Thumbscrews (2)
These screws secure the server to the rack.

2 Handles (2)
Use these handles when dismounting/mounting the server from/in the rack.

3 SCSI hard disk bays
Each number following the bold-faced number indicates the SCSI ID.

4 DISK lamp (green/amber)
Hard disk lamp. Each hard disk lamp is green during access to the hard disk. The lamp turns amber when the hard disk fails. The lamp flashes switching back and forth between green and amber during build processing (disk array configuration).

5 Flex bay
A hard disk, CD-ROM, or floppy disk drive can be mounted in this bay. A CD-ROM or floppy disk drive is mounted in the standard configuration. If a hard disk drive is mounted, SCSI ID8 is assigned to the bay.

6 CD-ROM drive
This drive reads data from CD-ROM media.
6-1 Disk access lamp
6-2 CD tray eject button
6-3 Emergency hole (used to remove CD-ROM media when the server is powered down)

7 3.5-inch floppy disk drive
This drive reads/writes data from/to the 3.5-inch floppy diskette.
7-1 Disk access lamp
7-2 Disk slot
7-3 Eject button

8 Backup device bay
Mount an optional DAT or AIT drive in this bay.

9 Front serial port 2 connector
Connect a device having a serial interface to this connector.

10 USB connectors (2 ports)
Connect device compliant with the USB interface to the connectors. (Windows NT 4.0 requires a compliant driver.)

11 Lamps (See the previous figure for a description of these six lamps.)

12 POWER switch
Press this switch to turn the server on/off. Pressing the switch once turns on the power, and the POWER lamp is lit. Pressing this switch again turns off the power. Once power is applied to the server, pressing this switch for 4 seconds or more turns off the power.

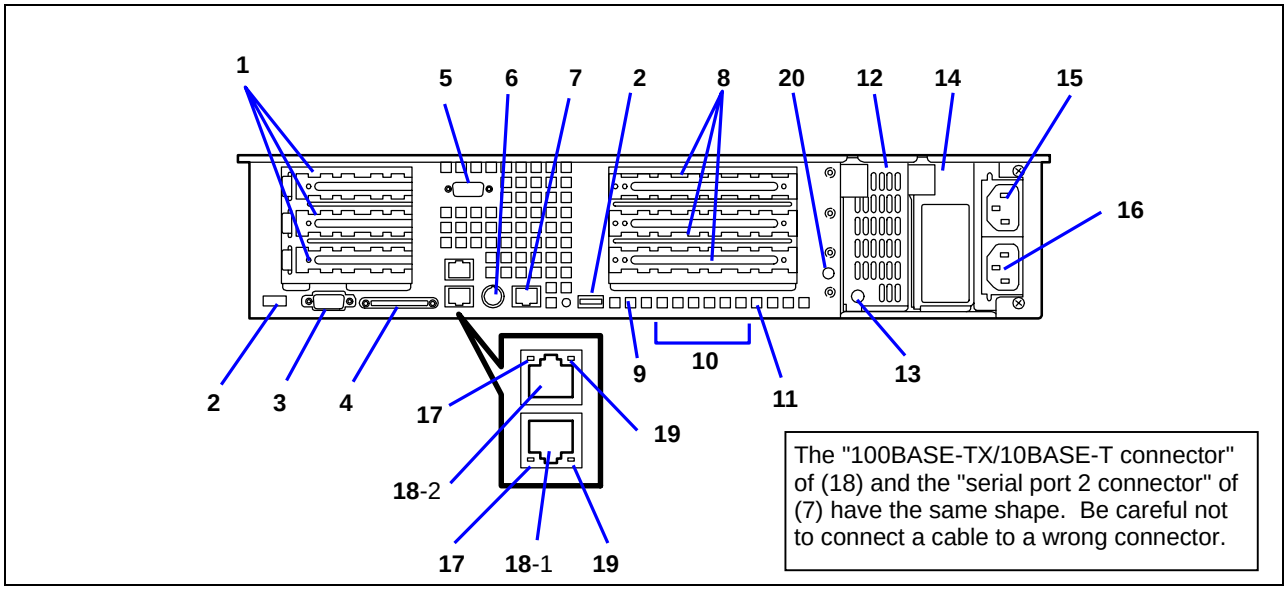
13 Reset switch
Press this switch to reboot the server.

14 DUMP switch
Press this switch to dump system memory.

15 UID (unit ID) switch
Press this switch to turn the UID lamps on/off on the front and rear panels of the server. Pressing the switch once turns the lamps on. Pressing this switch again turns the lamps off.

Rear View

The following figure shows the location of the features located at the rear of the system.



1 **Low-profile PCI board extension slots**
Mount low-profile type PCI boards these slots. The slots are designated 3C, 2C, and 1C.

2 **USB connector**
Connect a device compliant with the USB interface to this connector. (Windows NT 4.0 requires a compliant driver.)

3 **Monitor connector**
Connect the display monitor to this connector.

4 **SCSI connector**
Connect external SCSI devices to this connector.

5 **Serial port 1 connector**
Connect a device having a serial interface to this connector.
Note: The console of a management PC can be connected only to serial port 2. (Changes to BIOS settings may be required) A leased line cannot be connected directly to this connector.

6 **Mouse/keyboard connectors**
Connect the mouse and keyboard to the connectors through the provided relay cables.

7 **Rear serial port 2 connector**
Connect device having a serial interface to this connector. BIOS settings may require changes depending on the device to be connected.
A leased line cannot be connected directly to this connector.

8 **Full-height PCI board extension slots**
Mount PCI boards of the full-height type in the slots. The slots are designated 3B, 2B, and 1B.

9 STATUS lamp (green/amber) (on the real panel)
This lamp indicates the server status. The lamp is green during normal operation. The lamp turns amber or flashes when the server enters an abnormal state.

10 POST lamps
The lamps are mounted on boards. They are on during POST after the power is turned on.

11 UID lamp (blue)
This lamp goes on when the UID switch is pressed. (The lamp also goes on when software issues a command.)

12 Power supply unit (power supply slot 1)
This unit supplies power to the server.

13 AC POWER lamp
This lamp turns green and flashes when the server receives AC power from the power cord. The lamp turns green when the server power switch is turned on, and it turns amber when a power failure occurs.

14 Power supply unit extension slot (power supply slot 2)
An optional power supply unit may be installed in this slot. The slot , when empty, is protected with the blank cover.

15 AC inlet (for the power supply unit provided as standard)
Connect the power cord to this socket when the power supply unit is mounted in power supply slot 0.

16 AC inlet (for an additional power supply unit)
Connect the power cord to this socket when the power supply unit is mounted in power supply slot 1.

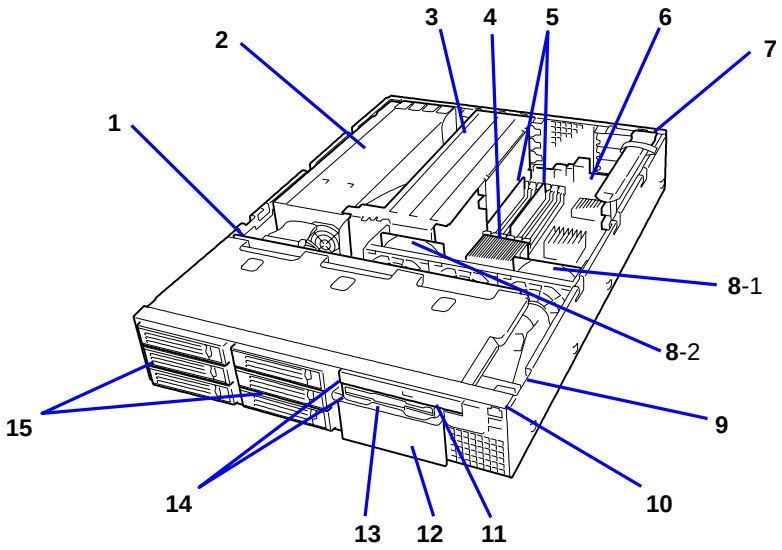
17 LINK/ACT lamp (green)
This lamp indicates data activity on the LAN.

18 100BASE-TX/10BASE-T connectors
Connect network systems on the LAN to the connectors.
The number "1" following the bold-faced number indicates LAN port 1, and the number "2" indicates LAN port 2.

19 Speed lamp (amber)
This lamp indicates the transmission speed of the LAN.

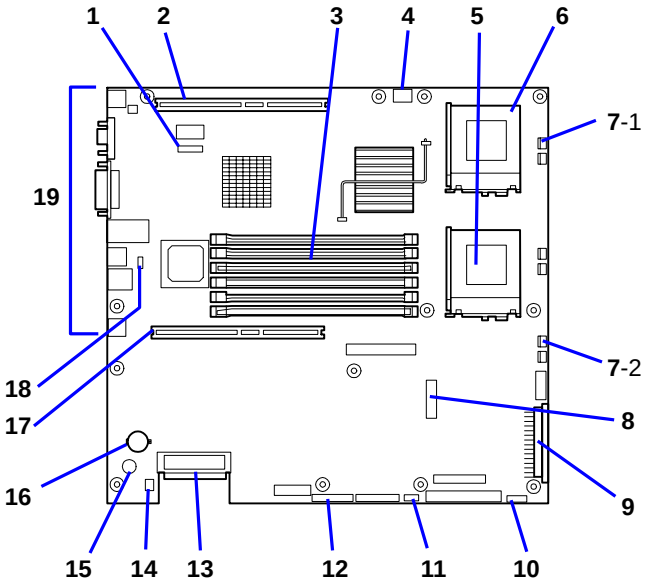
20 Hole for mounting the AC cord holder
Mount the provided AC cord holder as needed.

Internal View



1 **SCSI backplane**
2 **Power supply unit**
3 **Riser card (for full-height boards)**
4 **Processor (mounted under the heat sink)**
5 **DIMM (Two DIMMs are mounted as standard in slots #1A and #1B.)**
6 **System board**
7 **Riser card (for only low-profile boards)**
8 **Cooling fans**
(Each number following the bold-faced number indicates the corresponding fan name.)
8-1 System FAN 3
8-2 System FAN 1
9 **Cover open sensor**
10 **Front LED board**
11 **CD-ROM drive**
12 **Backup device bay**
13 **Floppy disk drive**
14 **Flex bays**
15 **Disk bays**

System Board



1 **ICMB connector**
2 **Connector for the PCI riser card**
(For only low-profile boards. 66 MHz/64-bit)
3 **DIMM sockets (for the interleave type)**
(The sockets are called #3B, #2B, #1B, #3A, #2A, and #1A sequentially from top.)
4 **Connector for the USB connector on the front panel**
5 **Processor #1 (CPU#1) socket**
6 **Processor #2 (CPU#2) socket**
7 **Cooling fan connectors**
7-1 System FAN 3
7-2 System FAN 1
8 **Peripheral interface connector**
9 **Main power connector**
10 **Power signal connector**
11 **SCSI IPMB connector**
12 **Configuration jumper switch**
13 **Internal SCSI connector**
14 **Connector for the access lamp**
(Connect the LED relay cable of an additional SCSI/disk array controller.)
15 **Speaker**
16 **Lithium battery**
17 **Connector for the PCI riser card**
(For full-height boards. 66 MHz/64-bit)
18 **Jumper pin for selecting serial port specification (J6A2)**
19 **Connectors for external device**

STATUS INDICATORS

This section describes the server indicator lamps.

POWER Lamp ( )

The POWER lamp is on (green) when power is applied to the server and the power switch is on. It is off if power is not applied to the server.

This server does not support the power saving mode.

STATUS Lamp ( )

Server STATUS lamps are located on the front and rear panels of the server. The STATUS lamps are on (green) while the server is operating normally. If the STATUS lamps are off or turn amber and flash it indicates that the server is in an abnormal state.

The table below provides more details on the system STATUS lamps.

NOTES:

- If ESMPRO or the offline maintenance utility is installed, you can confirm the cause of a failure by referring to the error log.
- If shutdown processing can be performed through the operating system, restart the system by performing normal shutdown processing. If shutdown processing cannot be performed, restart the system by resetting, forcibly turning the power off, or disconnecting and then connecting the power cord.

STATUS lamp indication	**Description**	**Procedure**
On (green)	The server is operating normally.	No action required.
Flashing (green)	The server is operating with the memory, CPU, or power supply unit in degraded state. Multiple correctable memory errors were detected	CPU or memory error. Verify which CPU or memory bank was disabled by entering the F2 BIOS Setup menu and replace the component as soon as possible. Multiple single-bit ECC errors detected. Contact your field service representative to arrange the replacement of memory.
Off	The power is off.	No action required.
	POST is in progress.	Wait. The STATUS lamp turns green when POST is completed.
	A CPU error occurred.	Turn the power off and then turn it on. If the POST screen displays an error message, note the message, and contact your sales representative.
	A CPU temperature alarm was detected. (Thermal-Trip)	
	A timeout occurred when the time set for the watchdog timer arrived.	
	An uncorrectable memory error was detected.	
	A PCI system error occurred.	
	A PCI parity error occurred.	
	A CPU bus error occurred.	
	A memory dump request is made.	Wait until the memory dump is completed.
On (amber)	A temperature alarm was detected.	Clean the internal fans. Check that no cables are obstructing the internal airflow. If the error persists, contact your field service representative.
	A voltage alarm was detected.	Contact your sales representative.
	All the power supply units failed.	
Flashing (amber)	Either of the following was detected in the redundant power configuration: • AC power not supplied to one of the two power supply units • Failure of one of the two power supply units	Connect the power cord to supply power. If the power supply unit is faulty, contact your sales representative.
	A fan alarm was detected.	Clean the internal fans. Check that no cables are obstructing the internal airflow. If the error persists, contact your field service representative.
	A temperature warning was detected.	Clean the internal fans. Check that no cables are obstructing the internal airflow. If the error persists, contact your field service representative.

DISK ACCESS Lamp ( )

The DISK ACCESS lamp indicates the status of the hard disk mounted in the 3.5-inch device bay. The lamp flashes green each time access is made to the hard disk.

When the DISK ACCESS lamp turns amber, it indicates that a hard disk failure has occurred. Check the hard disk lamp for the status of the failing hard disk.

If the DISK ACCESS lamp flashes off and on between green and amber or if the lamp turns amber and flashes, it indicates that rebuild (reconstruction) processing is being performed for a hard disk connected to the internal disk array controller.

IMPORTANT: If a hard disk in the server is connected to a disk array controller, the access lamp signal cable (provided with the server) must be connected from the disk array controller to the system board.

ACT Lamp ( )

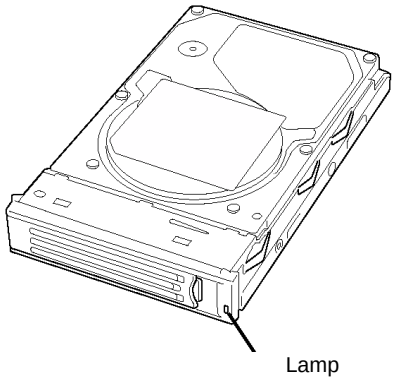
The ACT lamp is green while the server is connected to the LAN. The lamp flashes while the server is accessed via the LAN (during transmission/reception of packets). The number next to the icon indicates the network port number.

Disk access Lamp

The disk access lamp of the floppy disk drive or CD-ROM drive is on while the drive is accessed.

Hard Disk Lamp

The disk lamp mounted in the 3.5-inch device bay indicates the following, depending on the status:



- Flashing (green)

  The lamp indicates that the hard disk is being accessed.

- On (amber)

  The lamp indicates a failure of a hard disk mounted in disk array configuration.

  NOTE: Even if one of the hard disks fails in disk array configuration (RAID1, RAID5, or RAID0+1), the server can continue operation. However, replace the disk as soon as possible, and perform reconstruction (rebuild) processing. (The failing disk can be replaced in hot swap mode.)

- Flashing, switching back and forth between green and amber

  The lamp indicates that reconstruction (rebuild) processing is being performed for the hard disk. (This flashing does not indicate a failure.) When a failing hard disk is replaced in disk array configuration, the system automatically rebuilds the data (Auto-rebuild function). The lamp switches back and forth between green and amber during rebuild processing.

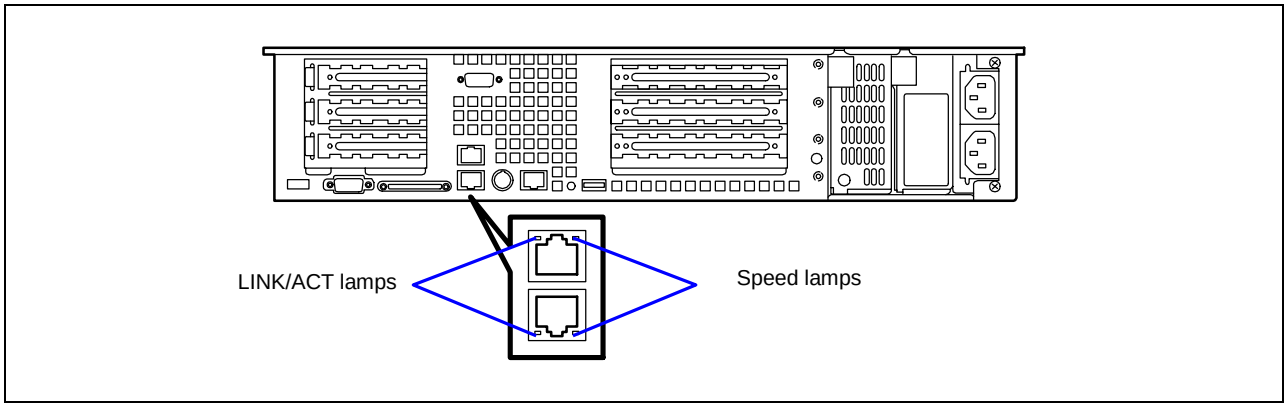
  The lamp goes off when the rebuild processing has completed. It turns a steady amber if the rebuild processing fails.

IMPORTANT: If the server is turned off during rebuild processing, the processing is stopped. Restart the server, mount the new hard disk in hot swap mode, and then perform rebuild processing again. Observe the following notes on using the auto-rebuild function.

- Do not turn the power off. (Once the power is turned off, the auto-build function does not start.)
- When dismounting a failed hard disk drive, wait 90 seconds before mounting the new hard disk drive.
- Do not replace a failing hard disk while rebuild processing is being performed on another hard disk.

LAN Connector Lamps

There are two lamps for each of the two LAN ports (connectors) on the rear panel.



- LINK/ACT lamps

  Each LINK/ACT lamp indicates the status of the standard network port of the server. While power is supplied to the server and HUB and the connection is correct, the lamp is on (green). The lamp turns green and flashes while the network port is transmitting/receiving data. (ACT)

  If the lamp does not go on when the port is connected to the LAN port, check the network cable. If the lamp does not go on and the network cable has checked out OK, the network (LAN) controller may be faulty. In this case, contact your sales representative.

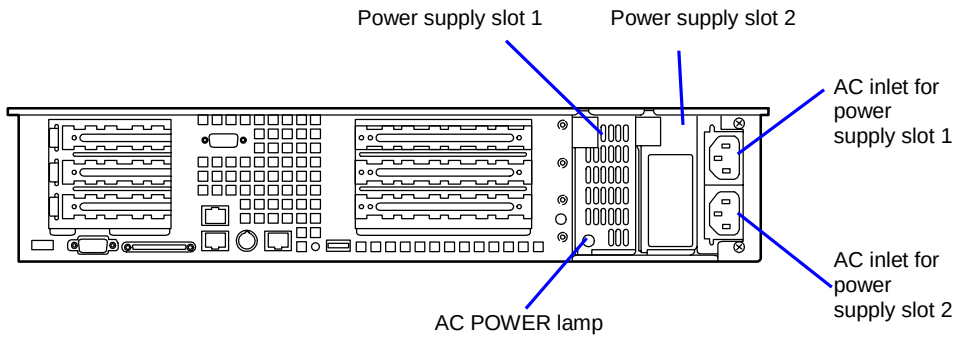
- Speed lamps

  Each Speed lamp indicates that the communication mode of the server is activated with either a network interface of 100BASE-TX or 10BASE-T. When the lamp is on (amber), it indicates that the communication mode is activated with 100BASE-TX. Data transfer rate is 100Mb/s. When the lamp is off, it indicates that the communication mode is activated with 10BASE-T. Data transfer rate is 10Mb/s.

AC POWER Lamp

There is an AC POWER lamp for the power supply unit on the rear. The lamp turns green and flashes when the power supply unit receives AC power from the power cord, which is connected to the AC inlet.

The lamp turns green when the server power switch is turned on. If the lamp does not go on when the server power switch is turned on or if it turns amber, the power supply unit is probably faulty. In this case, contact your sales representative to replace the power supply unit.

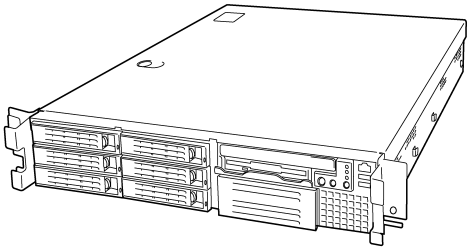


NOTE: If one power supply unit fails while an optional power supply is installed, the system can continue operation with the other power supply unit. (Redundant function) The failing power supply unit can be replaced in hot swap mode (with the power on) without the system being powered down.

STANDARD FEATURES

High performance

- Intel® Pentium® III Processor (1GHz/1.26GHz-S)
- High-speed 100BASE-TX/10BASE-T interface (100Mbps/10Mbps supported)
- High-speed disk access (Ultra160 SCSI x 2)
- High-speed memory access (133MHz, ECC, registered, PC/133 compliant, 72-bit, 68-pin, 3.3V)



Expandability

- Three full-length, full-height 64-bit/66-MHz PCI riser slots and three low profile 64-bit/66-MHz riser slots
- Large memory of up to 6 GB
- Seven hot-swap SCSI hard disk drive bays
- Up to two multi-processors are available for upgrade.
- One backup file bay
- Flex bay
- USB interface (A USB-support driver is required.)
- Two network ports

High-reliability

- Memory monitoring feature (1-bit error correction/ 2-bit error detection)
- CPU/memory degradation feature (logical isolation of a failed device)
- Bus parity error detection
- Temperature detection
- Error notification
- Internal fan monitoring feature
- Internal voltage monitoring feature
- Auto-rebuild feature (optional, hot-swappable)
- BIOS password feature
- Mechanical security lock
- Redundant power supply (hot-swap)

Management Utilities

- NEC ESMPRO
- NEC Management Workstation Application (NEC MWA)

Maintenance Features

- Off-line Maintenance Utility
- Memory dump feature using the DUMP switch

Many Available Features

- Graphic accelerator "RAGE XL" support
- Bootable CD-ROM (no emulation mode) format support
- POWER switch mask
- Software power-off
- Remote power-on feature
- AC-LINK feature
- Baseboard Management Controller (BMC)
- Consoleless feature

Self-diagnosis

- Power On Self-Test (POST)
- Test and Diagnosis (T&D)

Easy and Fine Setup

- NEC EXPRESSBUILDER (system setup utility)
- Configuration Parameter Diskette Creator
- SETUP (BIOS setup utility)
- SCSI*Select* (SCSI device utility)

Power Supplies

The power supply consists of the power supply bay and one power supply module. A second power supply module can be purchased to provide a redundant, 1+1 system. With either configuration, the power supply provides 350 watts of power and is designed to minimize EMI.

The power subsystem supports implementation of remote management features including remote enable that permits power to be activated from a variety of sources.

Peripheral Bays

Your server supports a variety of standard PC AT-compatible peripheral devices. The chassis includes these peripheral bays:

- An optional removable media front panel bay for mounting a half-height 3.5-inch peripheral device such as an optional tape drive.
- Depending on your configuration, your server includes either six or seven hot-swap SCSI hard disk drive bays for mounting hard disk drives installed in easily removable drive carriers.

  NOTE: The hot-swap SCSI hard disk drive bays contain a hot-swap back plane that require an 80-pin single connector attachment (SCA) connector on the drives that you install.

  – The flex bay can be used with either the standard CD-ROM/FDD module or a seventh hot swappable SCSI HDD.
  The CD-ROM/FDD module may only be inserted or removed from the flex bay when system power is turned off. The CD-ROM/FDD module is NOT hot swappable. The standard 3.5-inch diskette drive supports 720 KB and 1.44 MB diskette media.

  – The chassis includes two 80-mm non-hot-swappable system fans for cooling the processor(s), hard drives, and add-in cards. The system fans are mounted in a fan assembly located in the middle of the chassis to pull cooling air through the chassis. The power supply contains a single fan for cooling.

SAF-TE LOGIC

> **NOTE:** SAF-TE Logic is in systems that include the hot-swap SCSI disk drive cage. SAF-TE Logic is not available in systems that include the standard SCSI disk drive cage.

The SCSI backplane includes SAF-TE (SCSI Accessed Fault Tolerant Enclosure) logic that provides an interface to the disk subsystem that supports status signals, hot swapping drives, and enclosure monitoring.

The transport mechanism for the standardized alert detection and status reporting is the SCSI bus. Disk drives, power supplies, cooling fans, and temperature are continually monitored and the conditions then reported over the SCSI bus to the system. When used with RAID management software the user can be alerted of impending or imminent disk conditions requiring attention. This allows the user to react to conditions that could normally go unnoticed until data loss.

SYSTEM BOARD FEATURES

The following subsections describe the system board major components.

Processor

The system board accommodates one or two Intel Pentium III processors with 512k cache in the FC-PGA2 package. This processor uses the .13 micron technology and offers advanced performance. The processor external interface operates at a maximum of 133 MHz.

Memory

The system board contains six 168-pin DIMM slots each supporting 72-bit ECC (64-bit main memory plus ECC) registered SDRAM DIMMs (PC-133 compatible). Memory is two-way interleaved and partitioned in three banks. You may install a minimum of 256 MB (128MB × 2) and as much as 6 GB.

The controller automatically detects, sizes, and initializes the memory array, depending on the type, size, and speed of the installed DIMMs, and reports memory size and allocation to the server via configuration registers.

> **NOTE:** Use DIMMs that have been tested for compatibility with the system board.
> Contact your sales representative or dealer for a current list of approved memory modules.

PCI Riser Slots

The system board has two PCI riser slots, each capable of supporting 64-bit/66-MHz PCI riser cards.

PCI features:

- Bus speed up to 66 MHz
- 32 bit memory addressing
- 5 V/3.3 V signaling environment
- Burst transfers of up to 512 Mbps
- 8, 16, 32, or 64-bit data transfers
- Plug and Play ready
- Parity enabled.

Video

The system board uses an ATI RAGE XL PCI graphics accelerator with 8 MB of video SDRAM that supports all standard IBM VGA modes. The embedded SVGA video subsystem supports:

- Pixel resolutions up to 1600 x 1200 under 2D and 1024 x 768 under 3D
- CRT and LCD monitors up to 100 Hz vertical refresh rate

The system board supports disabling of the onboard video through the BIOS setup menu or when a plug in video card is installed in any of the PCI slots.

SCSI Controller

The system board includes an embedded Adaptec AIC-7899W controller providing dual Ultra160 Low Voltage Differential (LVD) SCSI channels.

The SCSI bus is terminated on the system board with active terminators that cannot be disabled. The onboard device must always be at one end of the bus. The device at the other end of the cable must also be terminated. LVD devices generally do not have termination built-in and need to have a termination source provided. Non-LVDs devices generally are terminated through a jumper or resistor pack on the device itself.

Network Controller

> **NOTE:** To ensure EMC product regulation compliance, the system must be used with a shielded LAN cable.

The system board uses two Intel ® 82550PM Fast Ethernet Controllers and supports two 10Base-T/100Base-TX network subsystems.

The 82550 PM controller supports the following features:

- 32-bit PCI, CardBus master interface
- Integrated IEEE 802.3 10Base-T and 100Base-TX compatible PHY
- IEEE 820.3u auto-negotiation support
- Chained memory structure similar to the 82559, 82558, 82557 and 82596
- Full duplex support at both 10 Mbps and 100 Mbps operation
- Low power +3.3 V device
- IP checksum off-loading.

On the system board, NIC 1 can be used as both a network interface and server management interface.

NIC Connector and Status LEDs

The 82550 controller drives LEDs on the network interface connector that indicate link/activity on the LAN and 10- or 100-Mbps operation. The green LED indicates network connection when on and TX/RX activity when blinking. The yellow LED indicates 100-Mbps operation when lit.

Network Teaming Features

> **NOTE:** Using both on-board NICs in a team does not allow the use of NIC 1 for server management access. To support both network teaming features and server management features, a third NIC must be added and teamed to NIC 2.

The network controller provides several options for increasing throughput and fault tolerance when running Windows NT 4.0, Windows 2000, NetWare 4.2 or newer:

- Adapter Fault Tolerance (AFT) - provides automatic redundancy for your adapter. If the primary adapter fails, the secondary takes over. AFT works with any hub or switch.
- Adaptive Load Balancing (ALB) - creates a team of 2 - 8 adapters to increase transmission throughput. Also includes AFT. Works with any 10Base-TX or 100Base-TX switch.
- Fast EtherChannel (FEC) or Intel ® Link Aggregation - creates a team of up to 8 adapters to increase transmission and reception throughput. Also includes AFT. Requires a FEC-enabled switch.

To set up an option, read the instructions in the Windows NT 4.0 or NetWare readme files.

General Configuration Notes

1. Windows NT versions prior to 4.0 do not support Adapter Teaming options.
2. Adapter Teaming options require NT 4.0 with Service Pack 4.0 or Service Pack 3.0 and the Windows Hot Fix .
3. In Windows NT, teaming options cannot be implemented on adapters that have been configured for VLANs. NetWare can support teaming options and VLANs on the same adapters.

Adapter Fault Tolerance

Adapter Fault Tolerance (AFT) is a simple, effective, and fail-safe approach to increase the reliability of server connections. AFT gives you the ability to set up link recovery to the server adapter in case of a cable, port, or network interface card failure. By assigning two server adapters as a team, AFT enables you to maintain uninterrupted network performance.

AFT is implemented with two server adapters: a primary adapter and a backup, or secondary, adapter. During normal operation, the backup will have transmit disabled. If the link to the primary adapter fails, the link to the backup adapter automatically takes over.

Preferred Primary Adapter

With multiple adapters installed, you can specify one as the Preferred Primary adapter. For example if you have a server with a PRO/1000 server adapter as the primary adapter and a PRO/100+ adapter as the secondary, you could configure the PRO/1000 server adapter to be the preferred primary. In this scenario, if the PRO/1000 server adapter fails, the PRO/100+ will take over. Then when the PRO/1000 server adapter is replaced, it will automatically revert to being the primary adapter in the team.

If a Preferred Primary is not selected, PROSet will attempt to select the best adapter, based on adapter model and speed.

Mixed Adapter Teaming

AFT supports up to eight server adapters per team, in any mix.

Adaptive Load Balancing

Adaptive Load Balancing (ALB) is a simple and efficient way to increase your server's transmit throughput. With ALB you group server adapters in teams to provide an increased transmit rate (up to 8 Gbps) using a maximum of eight adapters. The ALB software continuously analyzes transmit loading on each adapter and balances the rate across the adapters as needed. Adapter teams configured for ALB also provide the benefits of AFT. Receive rates remain at 100 Mbps or 1 Gbps depending on the primary adapter's capability.

To use ALB, you must have 2-8 server adapters installed in your server or workstation and linked to the same network switch.

Keyboard and Mouse

The keyboard/mouse controller is PS/2-compatible. The server may be locked automatically if there is no keyboard or mouse activity for a predefined length of time. Once the inactivity (lockout) timer has expired, the keyboard and mouse do not respond until the previously stored password is entered. A Y-cable is included with your server and can be used if both a PS/2 mouse and keyboard are required at the same time. The keyboard and mouse are ordered separately.

RJ-45 Serial Port

The rear RJ-45 serial port is a fully functional COM port that supports any standard serial device and provides support for serial concentrators, which typically support RJ45 serial connectors. For server applications that use a serial concentrator to access the server management features of the system board, a standard 8-pin CAT-5 cable from the serial concentrator is plugged directly into the rear RJ45 serial port. The 8 pins of the RJ45 connector can be configured to match either of two pin-out standards used by serial port concentrators. To accommodate either standard, the J6A2 jumper block located directly behind the rear RJ45 serial port must be jumpered appropriately according to which standard is desired.

See Chapter 2 for detail explanation.

ACPI

The system board supports the Advanced Configuration and Power Interface (ACPI) as defined by the ACPI 1.0 and PC97 specifications. An ACPI aware operating system can put the system into a state where the hard drives spin down, the system fans stop, and all processing is halted. However, the power supply will still be on and the processors will still be dissipating some power, so the power supply fans will still run.

The system board supports sleep states s0, s1, s4, and s5:

- s0: Normal running state.
- s1: Processor sleep state. No context will be lost in this state and the processor caches will maintain coherency.
- s4: Hibernate or Save to Disk: The memory and machine state are saved to disk. Pressing the power button or other wakeup event will restore the system state from the disk and resume normal operation. This assumes that no hardware changes have been made to the system while it was off.
- s5: Soft off: Only the RTC section of the CSB and the BMC are running in this state. No context is saved by the OS or hardware.

IMPORTANT: The system is off only when the AC power cord is disconnected.

System Board Management Controller (BMC)

Server management is concentrated in the System Board Management Controller (BMC). The BMC and associated circuitry are powered from a 5Vdc standby voltage, which remains active when system power is switched off, but the ac power source is still on and connected.

The BMC supports the Management Workstation Application (NEC MWA), which allows remote server management via a modem or direct connection to a manager system. Events monitored by the manager system include over-temperature and over-voltage conditions, fan failure, or chassis intrusion.

Information on MWA may be found on the EXPRESSBUILDER CD-ROM included with your server.

One major function of the BMC is to autonomously monitor system management events, and log their occurrence in the nonvolatile System Event Log (SEL). The events being monitored include over-temperature and over-voltage conditions, fan failure, or chassis intrusion. To enable accurate monitoring, the BMC maintains the nonvolatile Sensor Data Record (SDR), from which sensor information can be retrieved. The BMC provides an ISA host interface to SDR sensor information, so that software running on the server can poll and retrieve the server's current status.

The BMC performs the following:

- Monitors system board temperature and voltage
- Monitors processor presence and controls Fault Resilient Boot (FRB)
- Detects and indicates baseboard fan failure
- Manages the SEL interface
- Manages the SDR Repository interface
- Monitors the SDR/SEL timestamp clock
- Monitors the system management watchdog timer
- Monitors the periodic SMI timer
- Monitors the event receiver
- Controls secure mode, including video blanking, diskette write-protect monitoring, and front panel lock/unlock initiation
- Controls Wake On LAN via Magic Packet support.

DEGRADATION FEATURE

The degradation feature automatically isolates a failed DIMM or processor to assure continuous operation of the server when the POST (Power On Self-Test, self-diagnosis program after power on) detects such a DIMM or processor.

> **NOTE:** The degradation feature is only available when at least two DIMMs or processors are installed.

Failed DIMMs and processors may be identified on the screen that the POST displays, or with the BIOS setup utility of the server, "SETUP." They may also be identified on the system that has the ESMPRO installed.

REMOTE POWER-ON FEATURE (WAKE ON LAN)

The remote power-on function turns on the server through a network. It sends a special packet from the management computer to a remote server to turn it on if the server is off-powered.

To enable this feature, you must select "Enabled" for "Wake On LAN" in the Wake On Event of the System Hardware menu of the BIOS setup utility, "SETUP." (See Chapter 3.)

The remote power-on feature is not available in the following cases. Press the POWER switch once to start the OS, and turn off the server in an appropriate procedure.

- Abnormal previous system shut-down
- No power supply to the server (due to turned-off breaker, disconnected power cord, power blackout, etc.)

AC-LINK FEATURE

When the power cord of the server is connected to an uninterruptible power supply (UPS) unit, the server supports the power linkage feature that enables control over the power supply from the UPS to the server. The AC-LINK feature can be enabled or disabled with the System Hardware menu of the BIOS setup utility, "SETUP." (See Chapter 3.)

SYSTEM SECURITY

To help prevent unauthorized entry or use of the system, the system includes a full lockable front bezel and Server Management software that monitors the front bezel intrusion switch.

Security with Mechanical Locks and Monitoring

To unlock the bezel, insert the key in the lock and turn the lock counterclockwise until it stops (about a quarter turn). The bezel is now unlocked and can be opened again.

To lock the bezel, insert the key in the lock. Turn the lock clockwise until it stops (about a quarter turn). The bezel is now locked and cannot be opened.

Software Locks via the BIOS Setup Utility

The BIOS Setup Utility provides a number of security features to prevent unauthorized or accidental access to the system. Once the security measures are enabled, you can access the system only after you enter the correct password(s). For example:

- Enable the keyboard lockout timer so that the server requires a password to reactivate the keyboard and mouse after a specified time out period – 1 to 120 minutes.
- Set and enable a supervisor password.
- Set and enable a user password.
- Set secure mode to prevent keyboard or mouse input and to prevent use of the front panel reset and power switches.
- Activate a hot key combination to enter secure mode quickly.
- Disable writing to the diskette drive when secure mode is set.
- Disable access to the boot sector of the operating system hard disk drive.

Using Passwords

You can set either the user password, the supervisor password, or both passwords. If only the user password is set, you:

- Must enter the user password to enter BIOS Setup.
- Must enter the user password to boot the server if Password on Boot is enabled in either the BIOS Setup.
- Must enter the user password to exit secure mode.

If only the supervisor password is set, you:

- Must enter the supervisor password to enter BIOS Setup.
- Must enter the supervisor password to boot the server if Password on Boot is enabled in either the BIOS Setup.
- Must enter the supervisor password to exit secure mode.

If both passwords are set, you:

- May enter the user password to enter BIOS Setup. However, you will not be able to change many of the options.
- Must enter the supervisor password if you want to enter BIOS Setup and have access to all of the options.
- May enter either password to boot the server if Password on Boot is enabled in either the BIOS Setup.
- May enter either password to exit secure mode.

Secure Mode

Configure and enable the secure boot mode by using the BIOS Setup. When secure mode is in effect:

- You can boot the server and the operating system will run, but you must enter the user password to use the keyboard or mouse.
- You cannot turn off system power or reset the server from the front panel switches.

Secure mode has no effect on functions enabled via remote server management or power control via the watchdog timer.

Taking the server out of secure mode does not change the state of system power. That is, if you press and release the power switch while secure mode is in effect, the system will not be powered off when secure mode is later removed. However, if the front panel power switch remains depressed when secure mode is removed, the server will be powered off.

Summary of Software Security Features

The table below lists the software security features and describes what protection each offers. In general, to enable or set the features listed here, you must run the BIOS Setup and go to the Security Subsystem Group, menu. The table also refers to the Setup utility.

Software Security Features

Feature	Description
Secure mode	How to enter secure mode: • Setting and enabling passwords automatically places the system in secure mode. • If you set a hot-key combination (through Setup), you can secure the system simply by pressing the key combination. This means you do not have to wait for the inactivity time-out period. When the system is in secure mode: The server can boot and run the operating system, but mouse and keyboard input is not accepted until the user password is entered. At boot time, if a CD is detected in the CD-ROM drive or a diskette in drive A, the system prompts for a password. When the password is entered, the server boots from CD or diskette and disables the secure mode. If there is no CD in the CD-ROM drive or diskette in drive A, the server boots from drive C and automatically goes into secure mode. All enabled secure mode features go into effect at boot time. To leave secure mode: Enter the correct password(s).
Disable writing to diskette	In secure mode, the server will not boot from or write to a diskette unless a password is entered. To write protect access to diskette whether the server is in secure mode or not, use the Setup main menu, Floppy Options, and specify Floppy Access as read only.
Set a time out period so that keyboard and mouse input are not accepted. Also, screen can be blanked, and writes to diskette can be inhibited	Specify and enable an inactivity time out period of from 1 to 120 minutes. If no keyboard or mouse action occurs for the specified period, attempted keyboard and mouse input will not be accepted. The monitor display will go blank, and the diskette drive will be write protected (if these security features are enabled through Setup). To resume activity: Enter the correct password(s).
Control access to using the BIOS Setup: set supervisor password	To control access to setting or changing the system configuration, set a supervisor password and enable it through Setup. If both the supervisor and user passwords are enabled, either can be used to boot the server or enable the keyboard and/or mouse, but only the supervisor password will allow Setup to be changed. To disable a password, change it to a blank entry or press CTRL-D in the Change Password menu of the Supervisor Password Option menu found in the Security Subsystem Group. To clear the password if you cannot access Setup, change the Clear Password jumper (see Chapter 3).
Control access to the system other than BIOS Setup: set user password	To control access to using the system, set a user password and enable it through Setup. To disable a password, change it to a blank entry or press CTRL-D in the Change Password menu of the User Password Option menu found in the Security Subsystem Group. To clear the password if you cannot access Setup, change the Clear Password jumper (see Chapter 3).

Feature	Description
Boot without keyboard	The system can boot with or without a keyboard. During POST, before the system completes the boot sequence, the BIOS automatically detects and tests the keyboard if it is present and displays a message.
Specify the boot sequence	The sequence that you specify in setup will determine the boot order. If secure mode is enabled (a user password is set), then you will be prompted for a password before the server fully boots. If secure mode is enabled and the “Secure Boot Mode” option is also enabled, the server will fully boot but will require a password before accepting any keyboard or mouse input.

EXPRESSBUILDER

The CD-ROM that comes with the server contains a setup utility called "EXPRESSBUILDER." When you have first installed the server or append features to the server, use the EXPRESSBUILDER to set up your server.

Refer to the EXPRESSBUILDER User's Guide, located on your EXPRESSBUILDER CDROM, for details.

> **IMPORTANT:** Do not use the EXPRESSBUILDER for any other computers than the server, nor other Express5800 series servers than the one that EXPRESSBUILDER is provided for. Not following this instruction may cause failures.

The major functions of the EXPRESSBUILDER are:

- To install the OS.
  It installs an operating system.
- To diagnose the system.
  It diagnoses the server.
- To create a support disk.
  It copies utilities in the EXPRESSBUILDER CD-ROM into a floppy disk to launch them from the floppy disk.
- To update the Windows System*
  It updates the several resources of Microsoft Windows 2000 or Windows NT.
- To install the utilities
  It install the management utilities of ESMPRO and MWA.
- To read the online documents*
  It opens the online document files (".PDF" files).

  * These functions are available under Windows system.

> **NOTE:** Some features among those listed above can be used from the remote computer via cross cable, modem, or LAN (consoleless feature). See Appendix B for details.

NEC ESMPRO

The ESMPRO is server management software that runs on the OS. The ESMPRO includes the ESMPRO Manager for the server monitoring terminal and the ESMPRO Agent for the server.

> **NOTE:** For details of major functions of the ESMPRO, system configuration and setups with the ESMPRO, refer to the ESMPRO User's Guide included on the ESMPRO CDROM.
> Available functions of the ESMPRO depend on the OS you install. Ask your sales agent for details.

OFF-LINE MAINTENANCE UTILITY

The Off-line Maintenance Utility is used for proactive maintenance and fault analysis of the server. Normally this utility is used by the maintenance engineer.

Refer to Chapter 6 for details.

SYSTEM DIAGNOSTIC UTILITY

The system diagnostic utility contained in the EXPRESSBUILDER is useful to prevent the hardware failures. Refer to the EXPRESSBUILDER User's Guide, located on your EXPRESSBUILDER CDROM, for details.

NEC MANAGEMENT WORKSTATION APPLICATION (NEC MWA)

The Management Workstation Application (MWA) is an application program for remote management of the server from a system management computer (a computer with the ESMPRO Manager running) through a network.

For more information on MWA, refer to the Management Workstation Application User's Guide included on the ESMPRO CDROM.

USING YOUR SERVER

This section describes basic operations of the server including how to use devices such as the floppy disk drive and the CD-ROM drive.

Front Bezel

Remove the front bezel to power on/off the server, to access the floppy disk drive, CD-ROM drive, and a removable media device, and to install/remove hard disks to the 3.5-inch device bays.

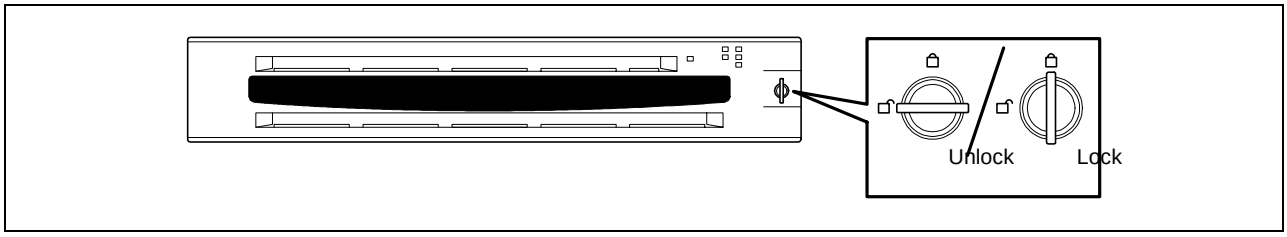
> **IMPORTANT:** To open the front door, you must unlock the door with the provided security key.

Installing or Removing the Front Bezel

When turning the power of the server on/off, accessing to the floppy disk drive, CD-ROM drive, or a removable media device, or installing or removing a hard disk from the 3.5-inch device bay, first remove the front bezel.

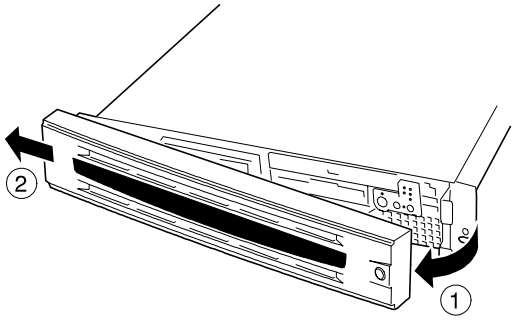
> **IMPORTANT:** The front bezel can be opened only when you unlock it by using the security key.

1. Insert the security key into the key slot and turn the key to the front bezel side with it pressed lightly to release the lock.

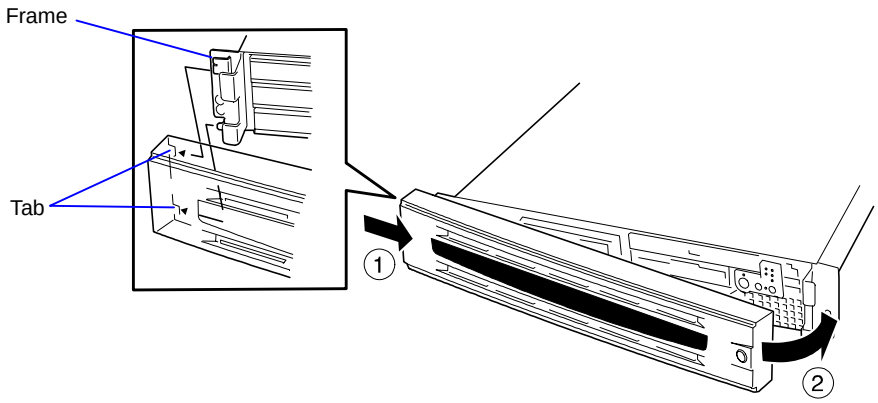


2. Hold the right end of the front bezel lightly, and pull it towards you.

3. Slide the front bezel to the left to remove the tab from the frame and then remove the front bezel from the server.



4. To install the front bezel, latch the tab at the left side of the front bezel on the server frame. After the installation, lock the front bezel for security.



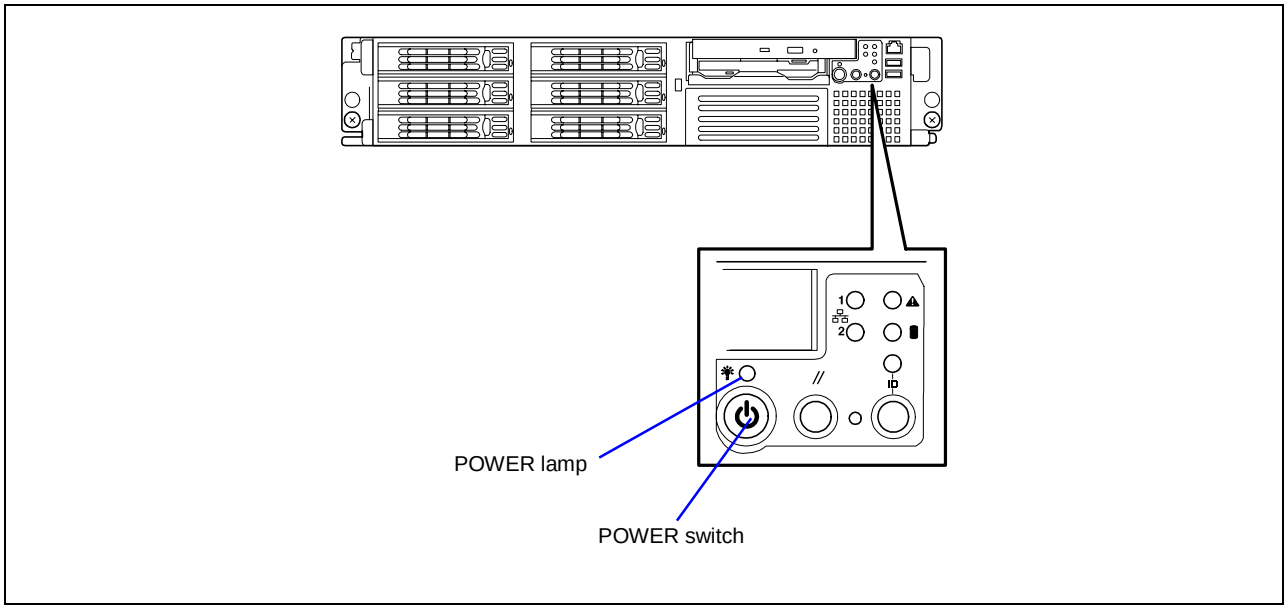
POWER Switch

Use the POWER switch to turn on/off the server.

Power On

Press the POWER switch on the front of the server chassis.

The POWER lamp lights in green.



IMPORTANT:

- If the power cord is connected to a power control device such as a UPS (Uninterruptible Power Supply), make sure that the power control device is powered up.
- When power is applied to the server, an initial diagnosis of the hardware starts. The POWER switch does not work while in diagnosis. Wait for about 10 seconds after power up, then press the POWER switch to turn the server off.
- Do not turn off the server until characters following the "NEC" logo appear on the screen.

POST

POST (Power On Self-Test) is the server's self-diagnostic program stored in system memory.

When you power on the server, the system automatically runs POST to check the system board, ECC memory module, CPU module, keyboard, and mouse. POST also displays messages from the BIOS Setup Utility, such as the start-up message, while in progress.

With the factory setup of the server, the logo appears on the display unit while POST is in progress. (To display the POST check results, press **Esc**.)

> **NOTE:** You can set the POST check results to appear on the display unit without pressing **Esc**. To do so, select "Enabled" for "Boot-time Diagnostic Screen" under the Advanced menu of the BIOS Setup Utility.

It is not necessary to check the POST check results. Check messages that POST displays when:

- You use the server for the first time.
- The server appears to fail.
- The server beeps for many times between power-on and OS start-up.
- An error message appears on the display unit.

POST Execution Flow

The following describes the progress of POST in chronological order.

IMPORTANT:

- Do not make key entries or perform mouse operations while POST is in progress.
- Some system configurations may display the message "Press Any Key" to prompt a key entry. This message is driven by the BIOS of an installed optional board. Make sure to read the manual that is included with the optional board before you make any key entry.
- Powering on the server after you installed or removed an optional PCI board or moved it to another slot, may display the massage that indicates incorrect board configuration and suspend POST. In such a case, press **F1** to continue POST. Board configuration can be made using the utility described later in this chapter.

1. After a few seconds from power-on, POST starts checking system memory. The count message of the basic and expansion memory appears at top left on the display unit screen. The memory check may takes a few minutes to complete depending on the memory size of the server. Also, it may take approximately one minute for the screen display to appear after rebooting the server.
2. Some messages appear upon completion of the memory check. These messages appear to indicate that the system has detected the CPU, keyboard, and mouse.
3. After a few seconds, POST displays the following message prompting you to launch the BIOS setup utility, SETUP, stored in the system memory of the server. This message appears at bottom left on the screen.

   ```
   Press <F2> to enter SETUP, Press <F12> to Network
   ```

   Launch the BIOS setup utility when you need to change the settings to meet the requirements for the server. As long as the above message is not displayed with an error message, you don't have to launch the utility. (Ignore the message. POST will automatically proceed.)

   To launch the SETUP utility, press **F2** while the above message is displayed. See Chapter 3 for setup and parameters.

   The server automatically restarts POST all over again when you exit the SETUP utility.

   Press **F12** to start the operating system from the network drive.

4. POST then detects the internal SCSI controller and display the massage prompting you to launch the SCSI device utility. (Ignore the message. POST will automatically proceed a few seconds later.)

   ```
   Press <Ctrl> <A> for SCSISelect(TM) Utility!
   ```

   To launch the SCSI device utility, press **Ctrl** and **A**. See Chapter 3 for setup and parameters.

   You need to use the SCSI device utility when:

   – You installed an SCSI device in a 5.25-inch device bay.

   – You connected an external SCSI device.

   – You changed internal SCSI device connections of the server.

   The server automatically restarts POST all over again when you exit the SCSI device utility.

   If more than one SCSI controller board is installed on the PCI bus of the server, the system detects the boot devices in order of the PCI slots 1C, 2C, and 3C (for low-profile boards), and then the PCI slots 1B, 2B, and 3B (for full-height boards). The system starts detecting the slots in each PCI riser card in ascending order of the slot numbers, and displays the message indicating activation of the SCSI BIOS SETUP utility. If the system drive is to be connected to a SCSI controller board (e.g., a disk array controller), connect it to the PCI slot 1C (for a low-profile board).

5. POST displays SCSI ID numbers used by the connected SCSI devices on the screen.

6. If an optional disk array controller is installed, the system displays the message prompting you to activate the disk array BIOS SETUP utility. (The start message and operation may vary depending on the mounted board.)

   For details, see the manual provided with the board or the online document on the EXPRESSBUILDER CD provided with the server.

7. If you set a password using the BIOS setup utility, SETUP, the password entry screen appears upon successful completion of POST.

   Up to three password entries will be accepted. Three incorrect password entries disable the server to boot. In such a case, turn off the power and wait about ten seconds before turning on to boot the server.

   IMPORTANT: Do not set a password before installing an OS.

8. The OS starts when POST completes.

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen. See Chapter 6 for POST error codes.

> **IMPORTANT:** Take a note on the messages displayed before consulting with your service representative. Alarm messages are useful information for maintenance.

Power Off

Follow the procedure below to power off the server. If the power cord of the server is connected to a UPS, refer to the manual that comes with the UPS or the manual for the application that controls the UPS.

> **IMPORTANT:** Always allow POST to complete before turning off the server.

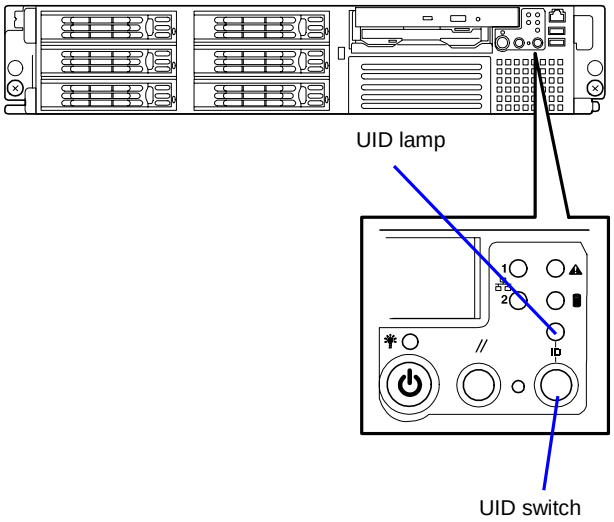
1. Shut down the OS.
2. Press the POWER switch on the front of the server.
   The POWER lamp goes off.
3. Power off peripheral devices.

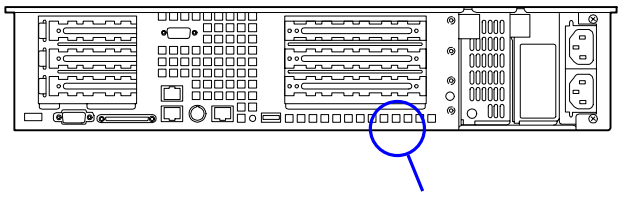
Identification of Servers ~ UID Switch ~

An "UID (unit ID) lamp" is provided on the front panel and rear panel. If more than one server is mounted in a single rack, the lamp identifies the server you are maintaining.

The UID lamp goes on when the UID (unit ID) switch on the front panel is pressed. It goes off when the switch is pressed again.

Maintenance from the rear of the rack has to be carried out in a dark, narrow space. The interface cable of a server or power supply unit in normal state may be disconnected by accident in this situation. To prevent this problem, you should start maintenance after confirming the target server by using the UID switch.





Floppy Disk Drive

The server is includes a 3.5-inch floppy disk drive.

The server supports the following 3.5-inch floppy disks:

- 2HD floppy disk (double-sided high-density track type)
  Stores data of 1.44MB.
- 2DD floppy disk (double-sided double-density track type)
  Store data of 720KB.

Make sure that the server is powered on (the POWER lamp is lit) before inserting a floppy disk into the floppy disk drive.

When you insert the floppy disk into the floppy disk drive, the drive clicks and the eject button on the floppy disk is slightly pushed out.

NOTES:

- When an unformatted floppy disk is inserted into the floppy disk drive, a message prompting formatting is displayed.
- If the floppy disk contains system startup files, powering on or restarting the server with the floppy disk inserted boots the system from the floppy disk.

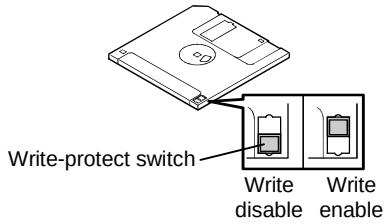
To eject the floppy disk from the floppy disk drive, press the eject button on the floppy disk drive.

NOTE: Make sure that the floppy disk access lamp is unlit before ejecting the floppy disk. Ejecting the disk when the access lamp is lit may destroy the disk data.

NOTE: Use of the floppy disk

The floppy disk is an important data storage media with delicate structure and requires care. Keep the following notes in mind to use it:

- Insert the floppy disk into the floppy disk drive gently.
- Do not write anything directly onto the disk surface with a pencil or ballpoint pen.
- Do not open the shutter.
- Do not use the floppy disk in a dusty place.
- Do not place anything on the floppy disk.
- Do not leave the floppy disk in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- Keep the floppy disk away from cigarette smoke.
- Keep the floppy disk away from any liquid (e.g., water) and chemicals.
- Keep the floppy disk away from any magnetic objects (e.g., magnet).
- Do not pinch the floppy disk with a paper clip or drop it.
- Keep the floppy disk in a floppy disk case that protects it from magnetism and dust.
- A floppy disk has a write-protect switch that prevents the stored data from accidental erasure. You can read data from a write-protected floppy disk, but you cannot save data into the floppy disk or format it. It is recommended that you should write-protect any floppy disk containing valuable data unless you are about to save data. To write-protect a 3.5-inch floppy disk, use the write-protect switch provided on its back.



- The floppy disk is a very delicate storage media. Dust or thermal changes, as well as operator's misconduct or sever failures, may cause loss of data. To avoid loss of data, you should make a back-up copy of your valuable data on a regular basis. (Make sure to make a back-up copy of every floppy disk provided with the server.)

CD-ROM Drive

The server is provided with the CD-ROM drive on its front to read data from a CD-ROM (read-

only compact disk). The CD-ROM provides larger and faster data read than the floppy disk.

⚠ CAUTION

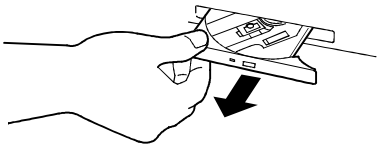
Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage.

Do not leave the tray ejected from the CD-ROM drive.

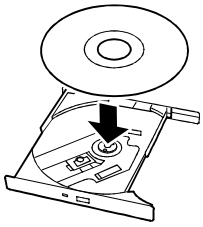
Insert a CD into the CD-ROM drive using the following procedure.

1. Confirm that the power of the server is on (with the POWER lamp being lit in green) before inserting the CD into the CD-ROM drive.
2. Press the Eject button on the front of the CD-ROM drive.

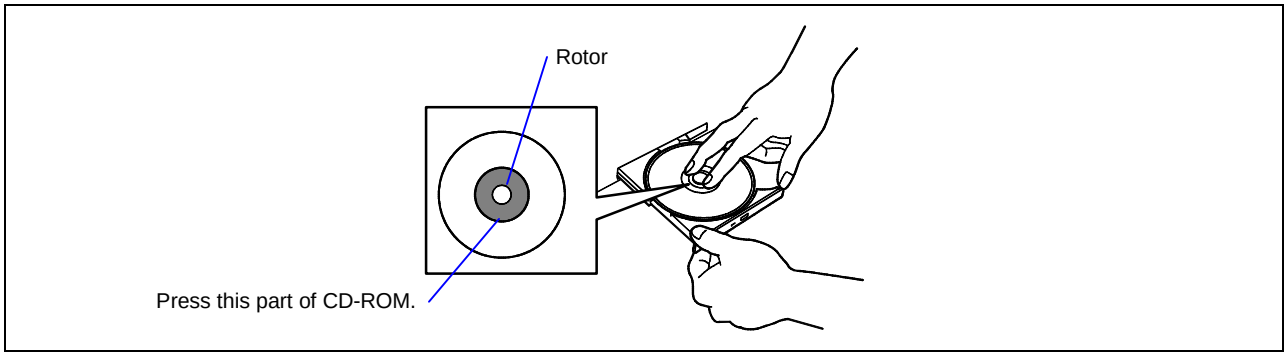
   The tray comes out a little.
3. Hold the tray lightly and pull it out toward you until the tray stops.



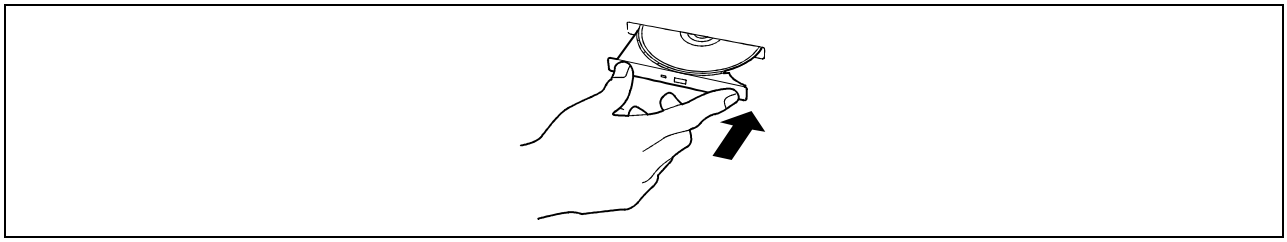
4. Put the CD on the tray carefully and securely with the character printed surface facing upward.



5. As shown in the figure below, hold the tray with a hand and press the CD with fingers of another hand to make the hole of the CD fit to the rotor at the center of the tray.

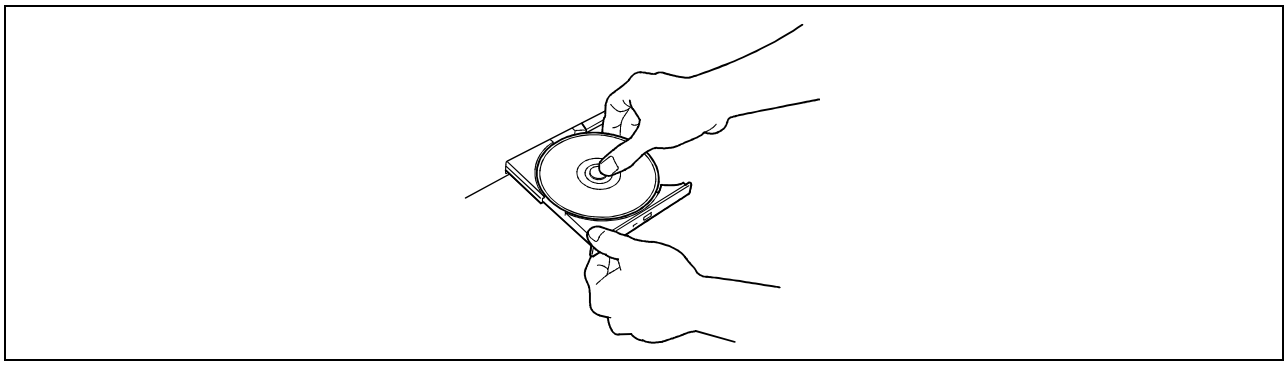


6. Push the front of the tray lightly to retract it into the drive.



IMPORTANT: If a noisy sound is heard after installing a CD into the CR-ROM drive, reinstall the CD.

To remove the CD from the CD-ROM drive, press the Eject button on the CD-ROM drive. The CD-ROM tray opens.

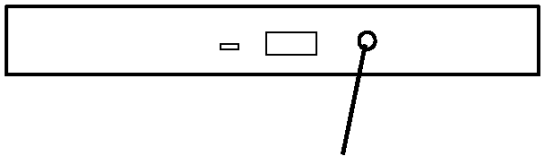


If the access lamp is lit in orange, the CD is being accessed. Confirm that the access lamp is not lit before pressing the Eject button.

As shown in the figure above, hold the tray with a hand and take the end of the CD lightly by the fingers of another hand. Lightly push downwards at the center of the rotor to remove the CD from the tray.

After removing the CD, close the tray.

To remove a CD from the CD-ROM drive when the power is off, follow the procedure below.



1. Press the POWER switch to power off the server. The POWER lamp goes off.
2. Insert a metal pin of approximately 1.2 mm in diameter and 100 mm in length (a straightened large paper clip) into the emergency hole on the right front of the CD-ROM drive and gently push it in until the tray opens.

   IMPORTANT:

   - Do not use a toothpick or plastic stick that is easy to break.
   - If the above procedure does not open CD-ROM drive, contact your service representative.

3. Hold the tray and pull it out.
4. Remove the CD.
5. Close the CD tray.

NOTE: Use of CDs

Keep the following notes in mind using a CD:

- Do not drop the CD.
- Do not place anything on the CD or bend the CD.
- Do not attach a label onto the CD.
- Do not touch the data side (nothing is printed on this side) with your hand.
- Do not scratch the CD or write anything directly on it with a pencil or ballpoint pen.
- Keep the CD away from cigarette smoke.
- Do not leave the CD in a high-temperature environment (e.g., place exposed to direct sunlight or close to a heater).
- When dust or fingerprints are on the CD, wipe the CD from its center to edge with a dry soft cloth slowly and gently.
- Use the CD cleaner to clean the CD. Do not use record spray/cleaner, benzene, or thinner.
- Store the CD in a CD case when not in use.
- If the CD emits large noise in the CD-ROM drive, remove the CD and re-insert it into the drive.

(This page is intentionally left blank.)

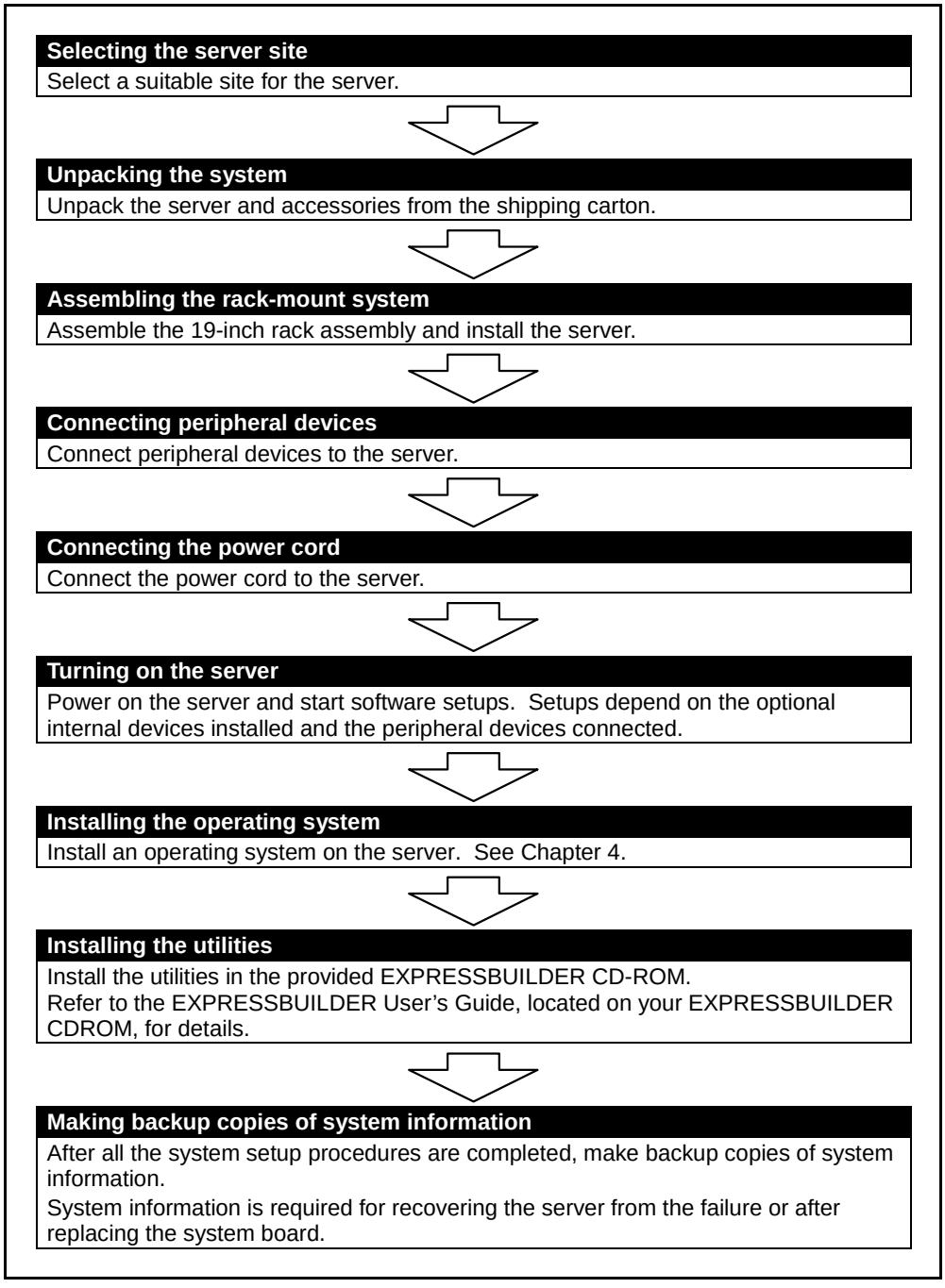
Chapter 2

Setting Up Your Server

This chapter describes how to select a site, unpack and install your rack-mount server, make cable connections, and power your server.

SETUP FLOW

Follow the flowchart below to set up the server.


Selecting the server site
Select a suitable site for the server.
Unpacking the system
Unpack the server and accessories from the shipping carton.
Assembling the rack-mount system
Assemble the 19-inch rack assembly and install the server.
Connecting peripheral devices
Connect peripheral devices to the server.
Connecting the power cord
Connect the power cord to the server.
Turning on the server
Power on the server and start software setups. Setups depend on the optional internal devices installed and the peripheral devices connected.
Installing the operating system
Install an operating system on the server. See Chapter 4.
Installing the utilities
Install the utilities in the provided EXPRESSBUILDER CD-ROM.
Refer to the EXPRESSBUILDER User's Guide, located on your EXPRESSBUILDER CDROM, for details.
Making backup copies of system information
After all the system setup procedures are completed, make backup copies of system information.
System information is required for recovering the server from the failure or after replacing the system board.

SELECTING A SERVER SITE

Installation

To use the server, you must install it into a standard EIA 19-inch rack assembly.

Installation of a Rack

Refer to the rack installation documentation or contact your sales agent.

⚠ WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions may result in serious personal injury.

Do not use the server in any unapproved location.
Do not connect the ground line to a gas pipe.

⚠ CAUTION



Observe the following instructions to install and use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage.

Do not carry or install the server by yourself. Two persons are required to safely carry or install this server.
Do not pull the server out of the rack if the rack is unstable.
Do not pull more than one device out from the rack at a time.
Ensure site wiring is adequate for the power rating of this server.

Do not install the rack in the locations listed below. Installing the rack or mounting the server into the rack in these locations may cause failure or damage to the server, or injury to personnel near the server.

- Narrow space from which devices cannot be pulled out from the rack completely
- Location that cannot bear the total weight of the rack and devices mounted in the rack
- Location where stabilizers cannot be installed
- Location with an uneven or slanting floor
- Location of drastic temperature change (near a heater, air conditioner, or refrigerator)
- Location where intense vibration may occur.
- Location where corrosive gas is generated, chemicals are nearby, or chemicals may be accidentally sprayed
- Location where anti-static carpeting is not used
- Location where some objects may be fall onto of into the rack
- Location near a device generating an intense magnetic field, such as a TV, radio, broadcast/communication antenna, power transmission wire, or electromagnetic crane. If unavoidable, contact your sales agent to request proper shield construction.
- Place where the power cord of the server must be connected to an AC outlet that shares the outlet of another device that uses large power consumption.
- Location near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay). If you must install the server close to such equipment, request your sales agent for separate power cabling or noise filter installation.

UNPACKING THE SYSTEM

When you receive your system, inspect the shipping containers prior to unpacking. If the shipping boxes are damaged, note the damage, and if possible, photograph it for reference. After removing the contents of the containers, store the cartons and the packing materials. If the contents appear damaged when you unpack the boxes, file a damage claim with the carrier immediately.

ASSEMBLING THE RACK-MOUNT SYSTEM

This subsection provides the instructions for the rack-mount server unit into a standard EIA 19-inch rack cabinet.

Also this subsection describes the removal procedures for the rack mount server unit from the 19-inch rack cabinet.

⚠ WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury.

Do not use any rack that does not conform to the relevant standards.
Disconnect the power cord(s) before installing or removing the server.

⚠ CAUTION



Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage.

Do not carry or install the server by yourself. Two persons are required to safely carry or install this server.
Do not pull the server out of the rack if the rack is unstable.
Do not pull more than one device out from the rack at a time.
Always install the server in the specified location.
Do not install the server in the rack without the covers installed.
Do not pinch your fingers between mechanical components.

Restricted Access Location

The server is intended for installation in a restricted access location, mounted above a non-combustible material.

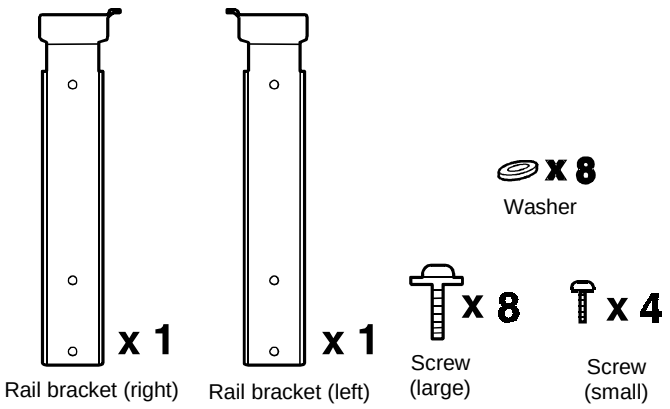
ESD Precaution

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground when handling system components.

Electronic devices can be easily damaged by static electricity. To prevent damage, keep them in their protective packaging when they are not installed in your system.

Checking Components

The following components are needed to install the server into the rack.



Required Tools

A Phillips screwdriver is required to install the server into the rack.

Rack Installation Procedure

Installation

Perform the following procedure to install the server into the rack:

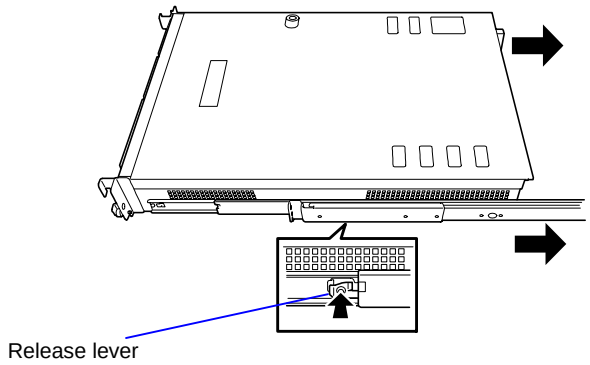
> **IMPORTANT:** When installing the cable arm, see the instruction manual provided with the cable arm assembly.

Removing the Rail Assemblies

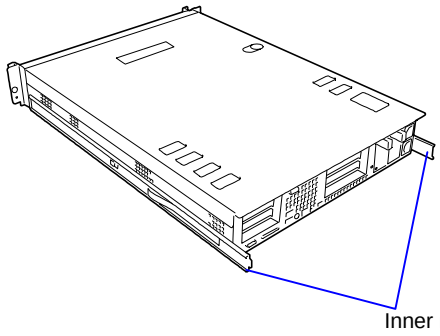
1. The rail assemblies are shipped already mounted to the sides of the server. Each rail assembly consists of a stationary rail attached to the server and a removable sliding rail. Following Steps 2 and 3, remove the sliding rails from the server.

> **IMPORTANT:** The removed rail assemblies are to be installed on the inner rails later. To install each rail assembly on the correct inner rail, mark each rail as removed. Similarly, when installing more than one server, distinguish between the pairs of inner rails and rail assemblies of the servers by marking the left and right hand rails.

2. Hold the rails and slowly slide them toward the rear of the server until a "click" is heard. The click indicates that the rails are in the locked position.
3. Push the release levers on the right and left sides of the rails, and remove the sliding rail assemblies from the server.



Note: The inner stationary rails remain screwed to the server when the rail assemblies have been removed.

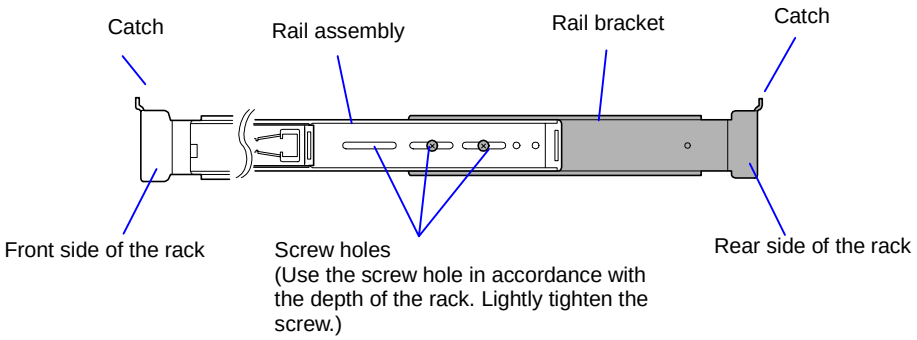


Installing the Rail Brackets onto the Sliding Rails

1. Install a rail bracket onto each sliding rail assembly as shown below.

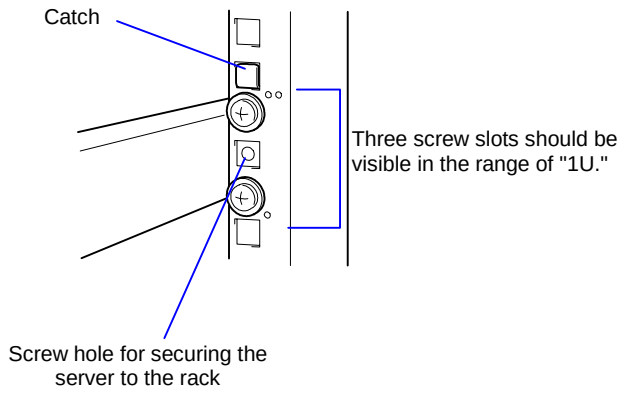


2. Line up the screw hole (slot) at the top end of each rail assembly to the screw hole in the rail bracket, and loosely tighten the screw to temporarily secure the rail assembly and bracket.
3. When each rail bracket is installed on the rail assembly, the catch tab at the top end of the rail bracket should point upwards like the catch tab at the opposite end of the rail assembly. See the Figure below.


Catch
Rail assembly
Rail bracket
Catch
Front side of the rack
Screw holes
(Use the screw hole in accordance with the depth of the rack. Lightly tighten the screw.)
Rear side of the rack

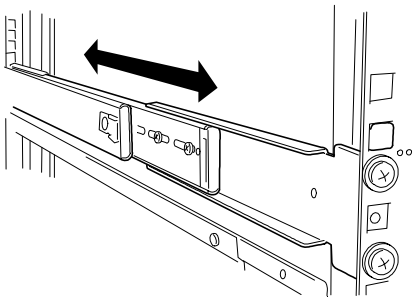
Installing the Rail Assemblies

1. Align the left slide rail assembly behind the mounting holes in the vertical-mounting rail located on the **left** side of the rack cabinet. The catch tabs on the front and rear of the slide rail assembly help to align it with the holes in the vertical-mounting rail.
2. Install two screws that secure the front of the slide rail assembly to the front vertical-mounting rail and loosely tighten them.

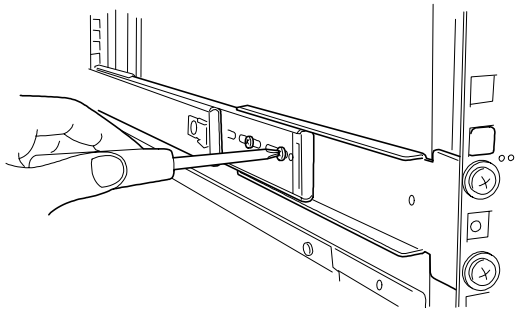


3. Carefully align the rear holes of the slide rail assembly with the holes in the rear vertical-mounting rail.
4. Install two screws that secure the rear of the slide rail assembly to the vertical-mounting rail.
5. Tighten all four screws holding the slide rail assembly to the vertical mounting rails.
6. Repeat steps 1 through 5 for the mounting the right slide rail assembly on the right side of the rack cabinet.

Note: The screws in the oblong slots of the outer slide rail may need to be readjusted and tightened.



7. Firmly secure the rail bracket to the slide rail and the rack.



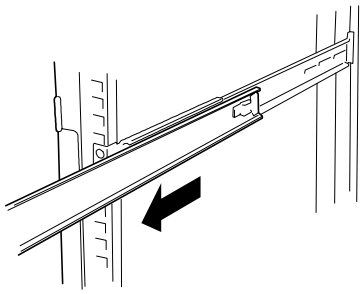
Installing the Server

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

Do not lift the server only by a single person.
Do not pinch your finger with mechanical components.

1. Extend the sliding rails of the right and left rail assemblies out of the system rack until they are locked.



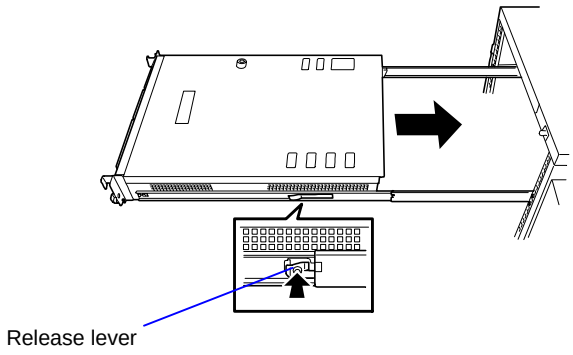
WARNING

At least two persons are required to install the server into the rack.

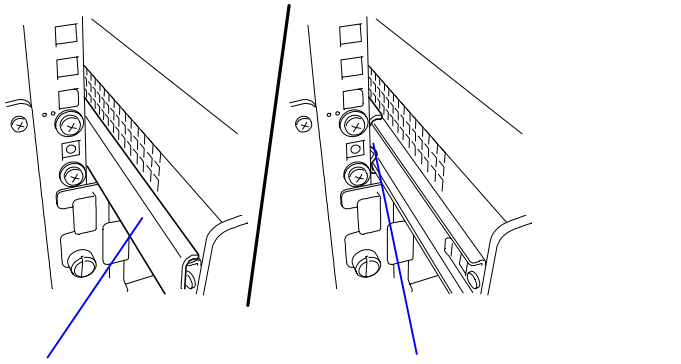
2. Firmly fit the inner rails on the sides of the server into the rail assemblies that are installed to the rack. Slowly push the server into the rack.

Note: If the server is locked on its way into the rack, slowly push it in while pressing the release levers on the right and left sides of the server.

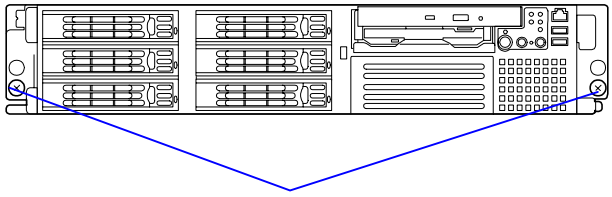
When the server is installed for the first time, the tight mechanical parts may offer resistance. You may feel strong friction when sliding the server into the rack.



3. Confirm that the sliding rails work normally by moving the server in and out of the rack several times.



Securing the Server



1. Push the server into the rack as far as it will go.
2. Tighten the right and left thumbscrews on the front panel to secure the server to the rack.
3. Install the front bezel.

This completes installing of the server.

Removing the Server from the Rack Assembly

⚠ WARNING

At least two persons are required to remove the server from the rack.

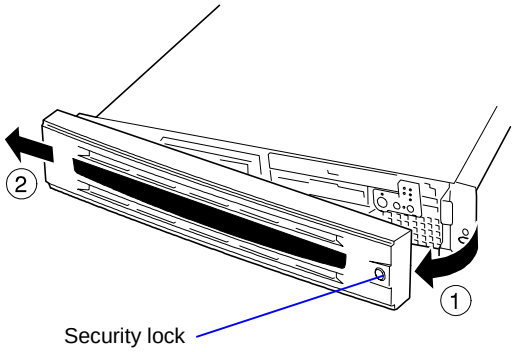
⚠ WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

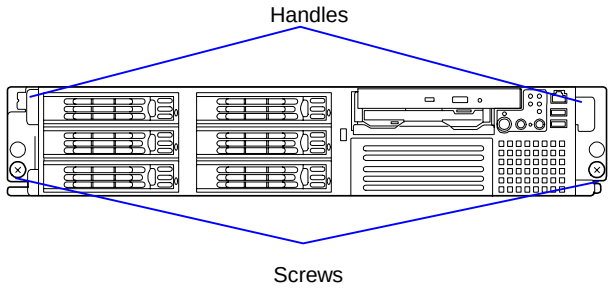
Do not attempt to lift the server by yourself. At least two persons are required to remove the server from the rack.
Do not pinch your finger in the mechanical components.
Do not pull any device out of the rack if the rack is unstable.
Do not pull more than one device out of the rack at one time.

1. Release the security lock, open and remove the front bezel.



2. Confirm that the server is powered OFF, and disconnect the power cable and all the interface cables connected to the server.
3. If a cable arm is installed, remove the two screws securing the cable arm to the server and remove the cable arm from the server.
4. Loosen the two front thumbscrews securing the server to the rack
5. Holding the handles, slowly and carefully pull the server out of the rack.

   A click is heard as the slide rails lock in the extended position.

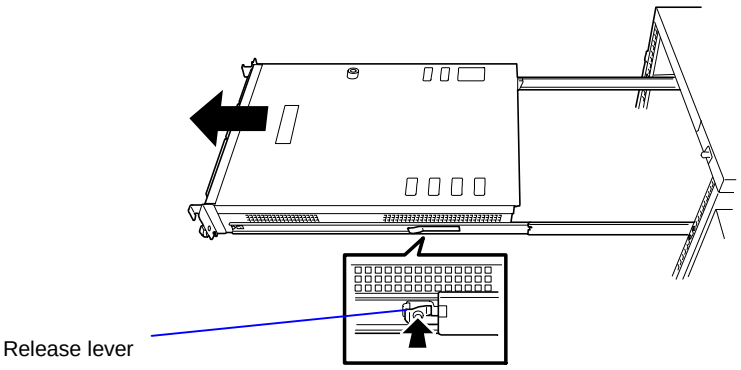


IMPORTANT:

- In the next step, with two persons holding the bottom of each side of the server, slowly slide the server out of the rack.

6. Press in the right and left release levers and carefully slide the server from the rack.

7. Place the server on a flat stable surface.



CONNECTING PERIPHERAL DEVICES

Connect peripheral devices to the server. The server is provided with connectors for wide variety of peripheral devices on its front and rear. The figure on the next page illustrates available peripheral devices for the server in the standard configuration and locations of the connectors for the devices.

⚠ CAUTION



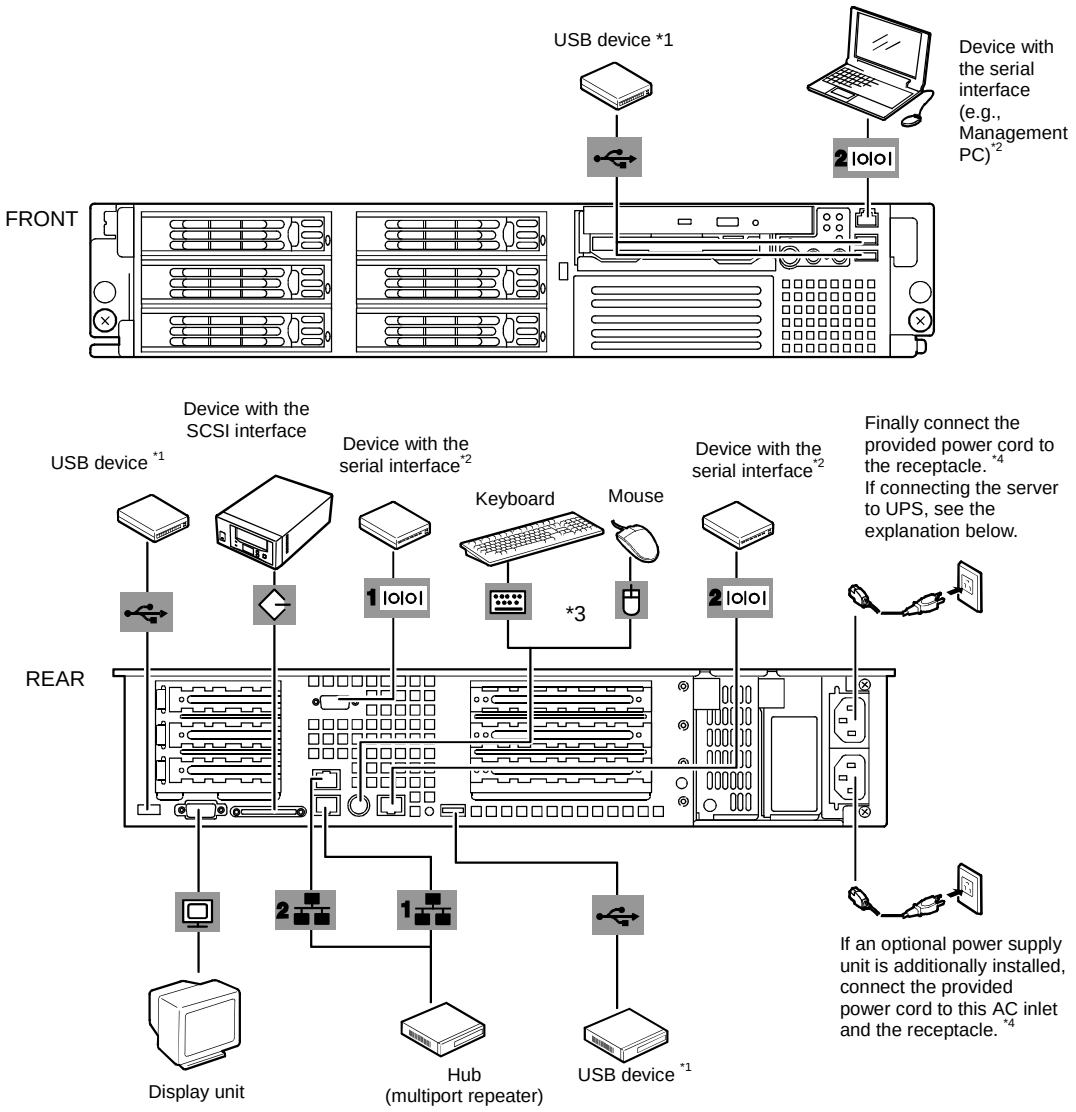
Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage.

Do not connect any interface cable when the power cord of the Express Server is plugged to a power source.

Do not use any unauthorized interface cable.

IMPORTANT:

- Power off the server and a peripheral device before connecting interface cables. Connecting a powered peripheral device to a powered server may cause malfunctions and failures.
- To connect a third-party peripheral device or interface cable to the server, consult with your sales agent for availability of such a device or cable. Some third-party devices may not be used with this server.
- The total length of a cable (including the connection cable in SCSI device) is limited by SCSI standards. Ask your sales representative for details. (The internal SCSI cable of the server is 0.5 m long.)
- The "100BASE-TX/10BASE-T LAN connector" and the "serial port 2 connector" of this server are identical. Be careful not to connect a cable to a wrong connector. Tag cables connected to these ports.
- A leased line cannot be connected directly to the serial port connectors.
- When using the front serial port connector for maintenance, do not connect any equipment to serial port 2 connector on the rear panel.
- Secure the power cord(s) and interface cables with a tie wrap.
- Bundle the cables to ensure they will not come into contact with the rack cabinet door or the guide rails on the sides of the server.
- Ensure there is some slack in the power cable at the AC inlet of the server. This is to prevent the power cord from coming off when the server is fully extended from the rack.
- Do not apply any pressure to the plug of the power cord.


USB device *1
Device with the serial interface (e.g., Management PC)*2
FRONT
Device with the SCSI interface
USB device *1
Device with the serial interface*2
Keyboard
Mouse
Device with the serial interface*2
Finally connect the provided power cord to the receptacle.*4
If connecting the server to UPS, see the explanation below.
*3
REAR
If an optional power supply unit is additionally installed, connect the provided power cord to this AC inlet and the receptacle.*4
Display unit
Hub (multiport repeater)
USB device *1

*1 Windows NT 4.0 needs the compliant driver. Any USB keyboard and mouse are not supported.
*2 A leased line cannot be connected directly to this connector.
The console of a management PC can be connected to only serial port 2. (BIOS setting required) Connect the console to only serial port 2 on either the front or rear panel. This connector is capped for preventing incorrect connection in the standard status.
*3 Use the provided branch cable.
*4 Connect the power cord to a circuit breaker of 15 A or less.

- **NOTE:** Be aware of the cable you are going to connect to the server. The "100BASE-TX/10BASE-T connector" and the "serial port 2 connector" of this server are identical. Be careful not to connect a cable to a wrong connector. Tag cables connected to these ports.

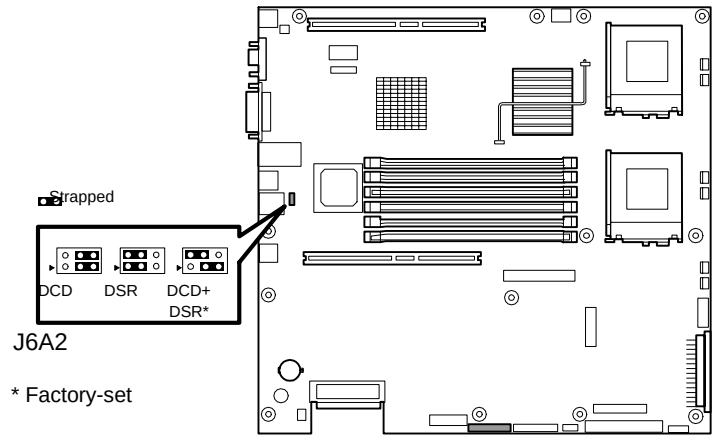
Connection to Serial Ports

Various types of serial devices can be connected to the RJ-45 serial ports on the front and rear panels of the server. Some devices require the setting of the jumper pin (J6A2) on the system board to be changed according to the DCD/DSR signal specification, or they need to be connected via an optional serial port conversion cable.

A set of two optional serial port conversion cables is provided with the server. The "F" labeled cable is used to connect devices to the RJ-45 serial ports on the front of the server and the "R" label cable is used to attached devices to the RJ-45 serial ports on the rear of the server.

IMPORTANT: Inter-equipment potential difference may cause a server failure. Be sure to turn off the server and the connection-destination equipment and disconnect the power cord before connecting/disconnecting the cable to/from the serial port.

The figure below shows the location of the jumper pin (J6A2). For procedures to dismount the cover and other internal components see Chapter 7.



CONNECTING THE POWER CORD

Connect the provided power cord to the server.

⚠ WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury.

- Do not hold the power plug with a wet hand.
- Do not connect the ground wire to a gas pipe.

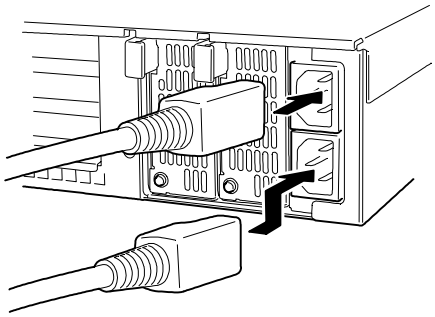
⚠ CAUTION



Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage.

- Do not plug the power cord in to an improper power source.
- Do not connect the power cord to an outlet that has an illegal number of connections.
- Insert the power plug into the outlet as far as it will go.
- Use an authorized power cord only.

1. Plug the provided power cord into the power receptacle on the rear of the server.
2. Plug the other end of the power cord into the wall outlet.



IMPORTANT: Secure the power cord with a tie wrap.

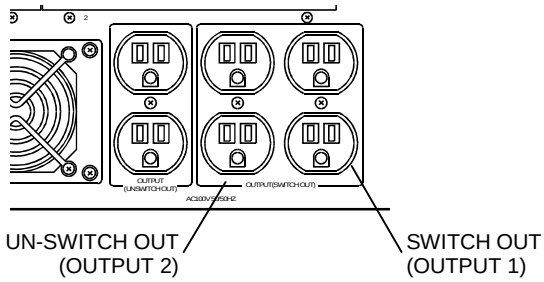
To connect the power cord from the server to an interruptive power supply (UPS), use service outlets on the rear of the UPS.

The UPS service outlets are categorized into two groups: SWITCH OUT and UN-SWITCH OUT. (They may be called "OUTPUT1" and "OUTPUT2".)

To control a power supply with an application (ESMPRO/UPS Controller) that controls the UPS, connect the power cord to the SWITCH OUT outlet.

For constant power, connect the power cord to a UN-SWITCH OUT outlet. (Also, connect the modem that is in continual service to this outlet.)

<Example>



When the power cord from the server is connected into a UPS, change the BIOS setup of the server to link with power supply to the UPS. Change the parameter for "After Power Failure" located under the System Hardware menu of the BIOS setup utility. See Chapter 3 for details.

TURNING ON THE SERVER

Power on the server and follow the on-screen instructions for setup.

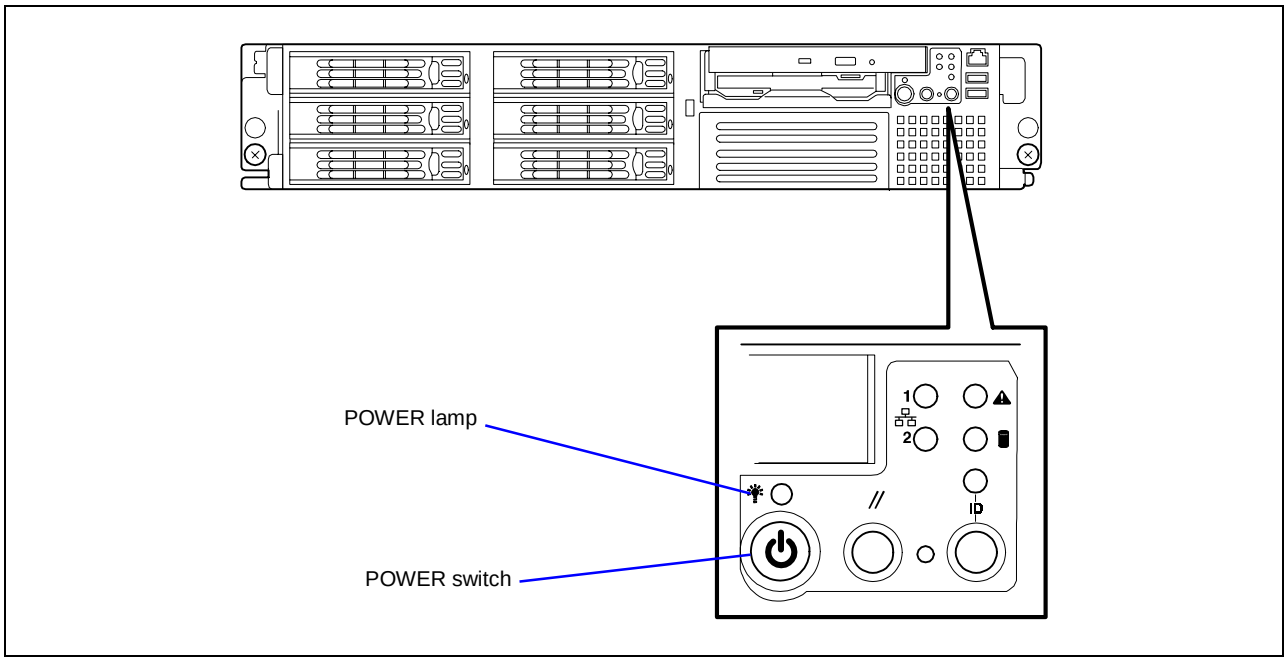
IMPORTANT: Before turning on the server:

- Some optional boards require BIOS changes, using the BIOS SETUP utility, before installation of the board. If the server has a PCI board with the PCI-to-PCI bridge installed, the SETUP utility is enabled to launch. Check on the option board specifications to find out whether it requires pre-installation BIOS setup before actually installing the board.
- Some installed optional devices or connected peripheral devices may require changes to the BIOS SETUP.

1. Make sure all external devices, such as a video display, keyboard, and mouse (optional) have been connected. Ensure the server power cord is connected.
2. Power on the video display and any other external devices.
3. Make sure that the floppy disk drive does not contain a floppy disk and the CD-ROM drive does not contain a bootable CD.
4. Open the front bezel.
5. Press the POWER switch.

NOTES:

- If the power cord is connected to the power control unit such as the UPS, turn on the power control unit.
- Connect the power cord and wait a few seconds before pressing the POWER switch. The POWER switch will not function for a few seconds after connecting the power cord to the UPS due to BMC (Baseboard Management Controller) firmware start-up.


POWER lamp
POWER switch
1
2
ID

The POWER lamp on the front of the server comes on.

In a few seconds, the NEC logo appears on the screen and the Power On Self-Test (POST) begins.

POST runs automatically when you power on or reset the server (**Ctrl** + **Alt** + **Delete**). POST runs diagnostics, initializes the server, sets interrupt vectors, detects installed peripheral devices, and boots up the operating system (if installed).

If the server halts before completing POST, POST emits a beep code indicating a fatal system error requiring immediate attention. (See Chapter 6, "Troubleshooting," for troubleshooting information.)

During the memory test, POST displays the amount of memory it was able to access and test. Depending on the amount of installed memory, it may take several minutes to complete the memory test.

NOTE: The factory default setting displays the NEC logo screen at startup. During startup you can change the NEC logo screen to the POST messages screen by pressing **Esc**. To change the start-up screen, use the BIOS setup utility, "SETUP." (See Chapter 3 for details.)

During POST, you will see a message prompting you to launch the BIOS SETUP utility.

Start the BIOS SETUP utility appropriate to your system environment to change the BIOS setup. For the BIOS SETUP settings for your server, see Chapter 3. For BIOS SETUP for the option board, refer to the manual that comes with the option board.

INSTALLING THE OPERATING SYSTEM

See Chapter 4 for installing the following operating systems.

- Microsoft Windows 2000
- Microsoft Windows NT 4.0
- Novell NetWare 5 or 5.1
- SCO UNIX 5.0X

To install operating systems not listed above, contact your sales agent.

IMPORTANT:

- Use EXPRESSBUILDER for initial setup of your server. EXPRESSBUILDER is support software for the Express5800 server. It simplifies the process of installing and configuring your server. Refer to the EXPRESSBUILDER User's Guide, located on your EXPRESSBUILDER CD for details. Before installing the operating system, adjust the system date and time by using the BIOS setup utility "SETUP." See Chapter 3 for details.

INSTALLING UTILITIES

To install utilities that are included with the server refer to the EXPRESSBUILDER User's Guide, located on your EXPRESSBUILDER CD.

MAKING BACKUP COPIES OF SYSTEM INFORMATION

The system information includes the current BIOS settings and other specific information for your server.

Save the information after completing system setup.

Without the system information backup data, you may not be able to recover the information.

You can save the information using the following procedures.

1. Insert the "NEC EXPRESSBUILDER" CD into the CD-ROM drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a floppy disk into the floppy disk drive.
6. Select [Save].

(This page is intentionally left blank.)

Chapter 3

Configuring Your System

This chapter describes Basic Input Output System (BIOS) configuration.

When you install the server for the first time or install/remove optional devices, thoroughly read this chapter for a better understanding BIOS setup requirements.

SYSTEM BIOS ~ SETUP ~

The BIOS SETUP utility allows you to make basic hardware configuration changes to the server. This utility is pre-installed in the flash memory of the server and is ready to run at system startup.

Your server is factory-configured with the correct BIOS parameter settings. These settings are referred to as the “default settings.” Normally, you won't need to make changes to the BIOS default settings.

IMPORTANT:

- The SETUP utility is intended for system administrator use only. Incorrect settings of BIOS parameters could make your server inoperable.
- The SETUP utility allows you to set a password. The server is provided with two levels of passwords: Administrator and User. With the Administrator password, you can view and change all system parameters of the SETUP utility. With the User password, system parameters available for viewing and changing are limited.
- Do not set any passwords before installing the operating system.
- Your server contains the latest version of the BIOS SETUP utility. Dialog boxes appear in your SETUP utility, thus, may differ from descriptions in this User’s Guide. If you find anything unclear, see the online help or ask your sales representative.

Starting the SETUP Utility

Powering on the server starts POST (Power On Self-Test) and displays its check results. If the NEC logo is displayed, press **Esc**.

After a few seconds, the following message appears at bottom left on the screen.

```
Press <F2> to enter SETUP
```

Press **F2** to start the BIOS SETUP utility and display its Main menu.

If you have previously set a password with the SETUP utility, the password entry screen appears. Enter the password.

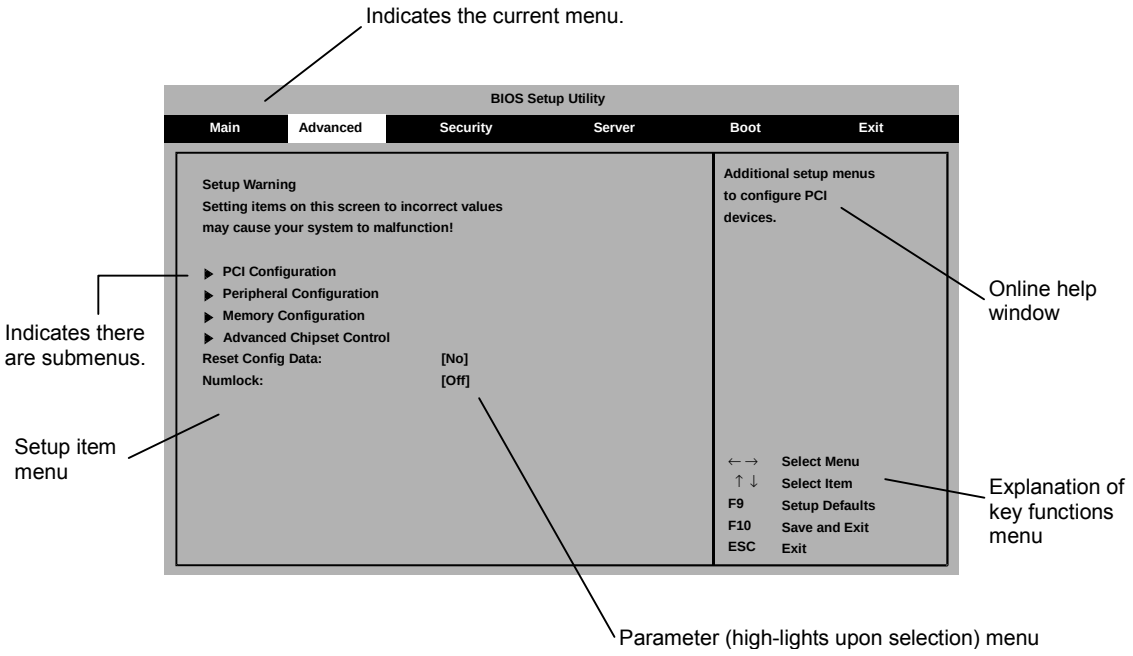
```
Enter password:[                ]
```

Up to three password entry tries will be accepted. If you fail to enter the password correctly for three consecutive times, the server halts. (You can no longer proceed.) Power off and then power on the server.

NOTE: The server is provided with two levels of password: Administrator and User. With the Administrator password, you can view and change all system parameters. With the User password, system parameters available for viewing and changing are limited.

Description of On-Screen Items and Key Usage

Use the following keyboard keys to make changes in the SETUP utility. (Key functions are also listed at the bottom of the screen.)



Cursor (↑, ↓):	Selects an item on the screen. The highlighted item is currently selected.
Cursor (←, →):	Selects the Main, Advanced, Security, Server, Boot, or Exit menu.
– and **+**:	Changes the value (parameter) of the selected item. When a submenu option (an option preceded by "►") is selected, these keys are disabled.
Enter	Press **Enter** to select (determine) parameters.
Esc	Displays the previous screen.
F1:	Press **F1** when you need help on SETUP operations. The help screen for SETUP operations appears. Press **Esc** to return to the previous screen.
F9:	Sets the parameter of the currently displayed item back to the factory set parameter.
F10:	Sets the parameter back to the one stored by the server before the SETUP utility was started.

Configuration Examples

The following describes examples of configuration changes required to use the software-link features or for system operations.

Date and Time

To display system date or time

Select [Main] - [System Time], [System Date].

Link with Management Software

To link with the temperature monitoring feature of ESMPRO

Select [Server] - [Temperature Sensor] - [Enabled].

To control the power supply of the server with ESMPRO Manager via the network

Select [Advanced] - [Advanced Chipset Control] - [Wake On Lan] - [Enabled].

UPS

To link the server power supply with the UPS

- To power on the server after a power failure when power is supplied from the UPS

  Select [Server] - [After Power Failure] - [Power On].

- To keep the server powered off after a power failure when power is supplied from the UPS, if the POWER switch was used to power off the server

  Select [Server] - [After Power Failure] - [Last State].

- To keep the server powered off after a power failure when power is supplied from the UPS

  Select [Server] - [After Power Failure] - [StayOff].

Boot

To change the boot order of devices connected to the server

Select [Boot] and specify the boot order.

To display POST check results

Select [Boot] - [Quiet Boot] - [Disabled].

You can also press **Esc** while the log is on the screen to display POST check results.

To use remote wake-up feature

- Via Modem:

  Select [Advanced] - [Advanced Chipset Control] - [Wake on Ring] - [Enabled].

- Via LAN:

  Select [Advanced] - [Advanced Chipset Control] - [Wake on LAN] - [Enabled].

- Via PCI device:

  Select [Advanced] - [Advanced Chipset Control] - [Wake on PME] - [Enabled].

- Via RTC alarm:

  Select [Advanced] - [Advanced Chipset Control] - [Wake on RTC Alarm] - [Enabled].

To control from the HW console

Select [Boot] - [Quiet Boot] - [Disabled].

Select [Server] - [Console Redirection] and set each item.

Memory

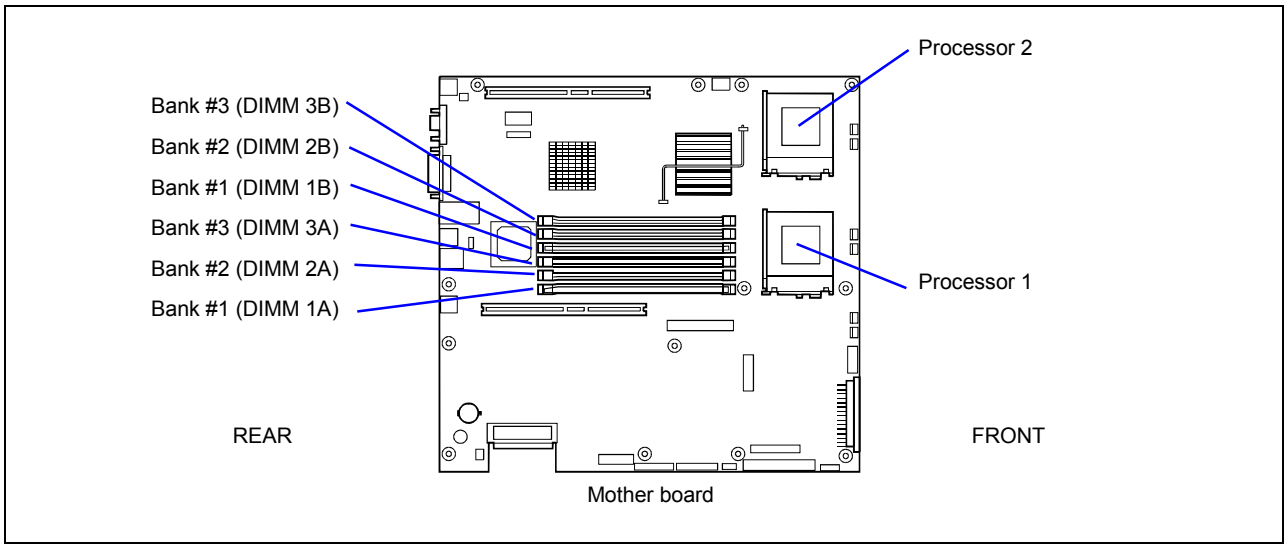
To enable the memory degradation feature

Select [Advanced] - [Memory Configuration] - [Extended Memory Test] - [Every-Location].

To check the installed memory (DIMM) status

Select [Advanced] - [Memory Reconfiguration] - [Bank #n] and check the status indications. (n: 1 - 3)

The on-screen DIMM numbers and socket locations on the system board are shown in the figure below.



To clear the memory (DIMM) error information

Select [Advanced] - [Memory Configuration] - [Memory Retest] - [Enabled] and reboot the server.

CPU

To check the installed CPU status

Select [Main] - [Processor Settings] and check the status indications.

The on-screen CPU numbers and socket locations on the system board are shown in the figure on the previous page.

To clear the CPU error information

Select [Main] - [Processor Settings] - [Processor Retest] - [Yes] and reboot the server.

Keyboard

To set Numlock

Select [Advanced] - [Numlock].

Security

To set passwords on the BIOS level

Select [Security] - [Set Administrator Password] and enter a password.

Set Administrator password first, then User password.

To enable/disable the POWER switch

Select [Security] - [Power Switch Inhibit] - [Enabled].

Select [Security] - [Power Switch Inhibit] - [Disabled].

IMPORTANT: Masking the POWER switch disables forced shutdown (see Chapter 6) as well as power on/off using the POWER switch.

To set the secure mode

Select [Security] - [Set User Password] and enter the password.

Select [Security] - [Secure Mode] and set each item.

External Devices

To set up external devices

Select [Advanced] - [Peripheral Configuration] and set up each device.

Internal Devices

To set up internal PCI devices of the server

Select [Advanced] - [PCI Configuration] and set up each device.

To install the disk array controller

Select [Advanced] - [PCI Configuration] - [PCI Slot nx ROM] - [Enabled].

nx= Riser card number (n: 1 to 3) and type (x: C is low-profile type and B is full-length/full-height type)

To clear the hardware configuration data (after installing/removing internal devices)

Select [Advanced] - [Reset Configuration Data] - [Yes].

Saving the Configuration Data

To save the BIOS configuration data

Select [Exit] - [Exit Saving Changes].

To discard changes to the BIOS configuration data

Select [Exit] - [Exit Discarding Changes] or [Discard Changes].

To resume the factory-set BIOS configuration data

Select [Exit] - [Load Setup Defaults].

To save the current settings as user-defined configuration

Select [Exit] - [Save Custom Defaults].

To load the user-defined configuration data

Select [Exit] - [Load Custom Defaults].

Menu and Parameter Descriptions

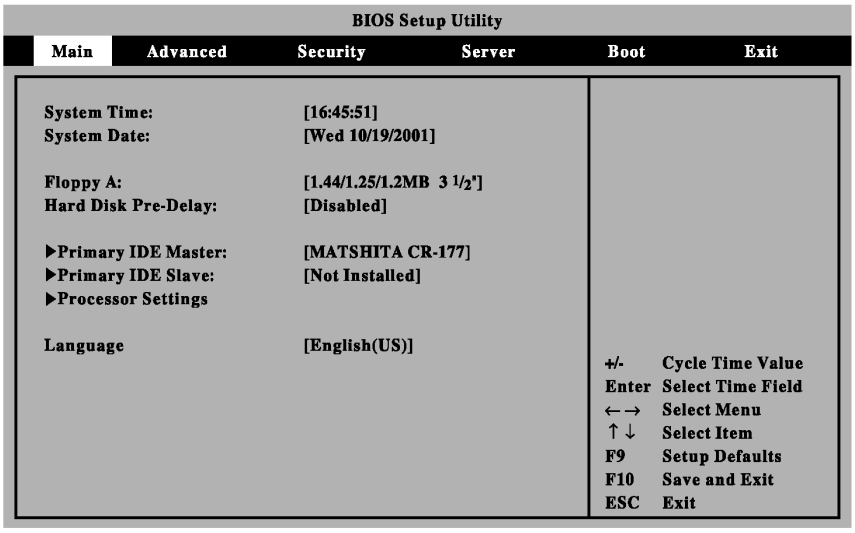
The SETUP utility has the following six major menus:

- Main
- Advanced
- Security
- Server
- Boot
- Exit

To set specific functions, select a submenu from the above menus. The following describes available functions and parameters, as well as the factory-set parameters, for each menu.

Main

Start the SETUP utility to display the Main menu. Menu items preceded by "►" mark have a submenu. Select an option with the "►" mark and press **Enter** to display its submenu.



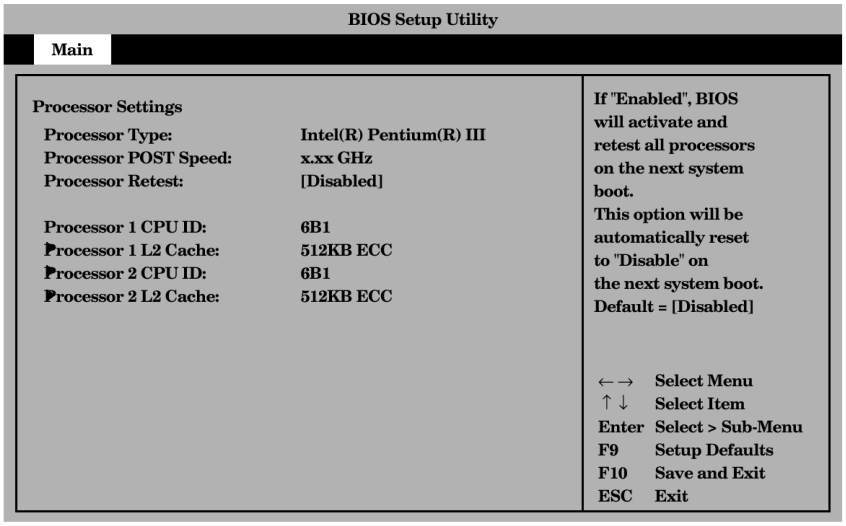
Available options in the Main and descriptions are listed below.

Option	Parameter	Description	Your Setting
System Time	HH:MM:SS	Sets the system time.	
System Date	MM/DD/YYYY	Sets the system date.	
Floppy A:	Not Installed [1.44/1.25 MB/1.2 MB 3.5"] 2.88 MB 3.5"	Sets the floppy disk drive A (standard configuration).	
Hard Disk Pre-delay	[Disabled] 3 seconds 6 seconds 9 seconds 12 seconds 15 seconds 21 seconds 30 seconds	Causes the BIOS to insert a delay before attempting to detect IDE drives in the system during POST.	
Primary IDE Master/ Primary IDE Slave	–	Displays information on the device connected to the channel. Some items may be modified, however, use the factory-set values.	
Processor Settings	–	Displays information on processor (CPU) and menu window to setup.	
Language	[English (US)] Français Deutsch Italiano Español	Selects which language SETUP displays.	

[ ]: Factory-set

Processor Settings

Select "Processor Settings" on Main menu to display the following menu.


BIOS Setup Utility
Main
Processor Settings
Processor Type: Intel(R) Pentium(R) III
Processor POST Speed: x.xx GHz
Processor Retest: [Disabled]
Processor 1 CPU ID: 6B1
Processor 1 L2 Cache: 512KB ECC
Processor 2 CPU ID: 6B1
Processor 2 L2 Cache: 512KB ECC
If "Enabled", BIOS will activate and retest all processors on the next system boot.
This option will be automatically reset to "Disable" on the next system boot.
Default = [Disabled]
← → Select Menu
↑ ↓ Select Item
Enter Select > Sub-Menu
F9 Setup Defaults
F10 Save and Exit
ESC Exit

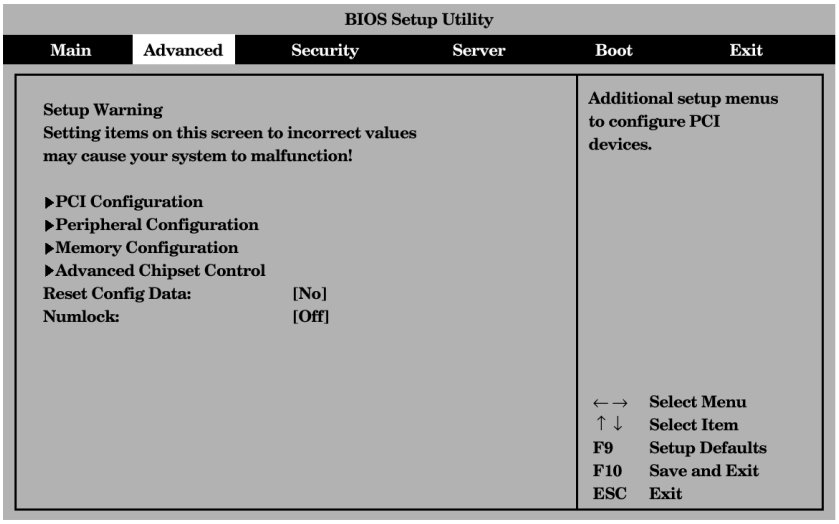
See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Processor Type	–	Reports the type of processor(s) installed in system. (View only)	
Processor POST Speed	–	Reports the speed of the processor measured at POST. (View only)	
Processor Retest	[Disabled] Enabled	Clears CPU error information and retests all processors on the next boot.	
Processor 1 CPU ID	Numeric (06xx)	Numeric indicates CPU 1 ID. Blank indicates that no processor is installed, or if installed, the processor failed. (View only)	
Processor 1 L2 Cache	–	Reports L2 Cache Size for Processor 1. (View only)	
Processor 2CPU ID	Numeric (06xx)	Numeric indicates CPU 2 ID. Blank indicates that no processor is installed, or if installed, the processor failed. (View only)	
Processor 2 L2 Cache	–	Reports L2 Cache Size for Processor 2. (View only)	

[ ]: Factory-set

Advanced

Move the cursor to "Advanced" to display the Advanced menu. Menu items preceded by "►" has submenus. Select an option with the "►" mark and press **Enter** to display its submenu.



See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Reset Config Data	[No] Yes	Select "Yes" to clear the configuration data (system information stored by POST). This parameter will be reset to "No" when the server restarts.	
Numlock	[Off] On	Enable or disable the Numlock function at system start-up. If "Auto" is selected, the Numlock function will be enabled when a keyboard entry is detected.	

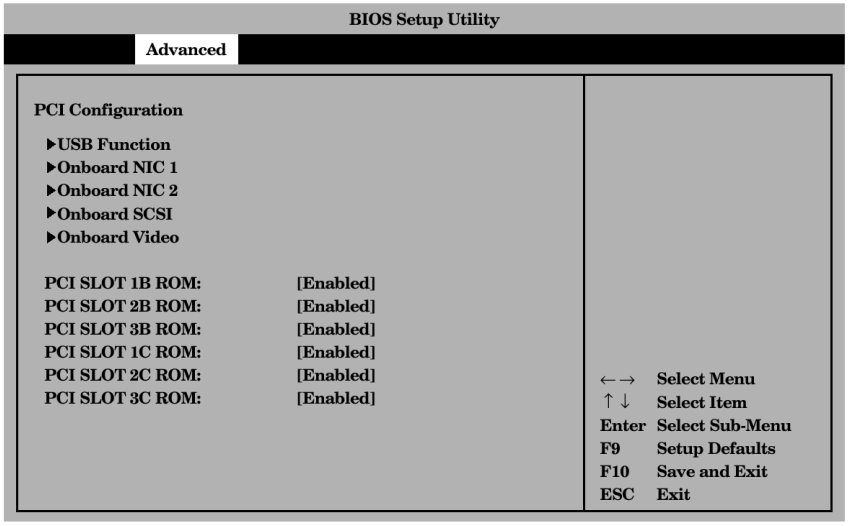
[ ]: Factory-set

IMPORTANT:

- The Boot Monitoring feature is not supported in this server.
- If Reset Config Data is set to "Yes", boot device priority is also cleared. Note the boot device priority before changing this parameter. Restart the server with Exit Saving Changes option, start BIOS SETUP utility, and restore the boot device priority.

PCI Configuration

Select "PCI Configuration" on the Advanced menu to display the following screen.



Option	Parameter	Description	Your Setting
PCI Slot nB ROM* (n: slot number)	[Enabled] Disabled	Used to enable or disable an option ROM that may be present on a PCI add-in card connected to the full-height riser card.	
PCI Slot nC ROM* (n: slot number)	[Enabled] Disabled	Used to enable or disable an option ROM that may be present on a PCI add-in card connected to the low-profile riser card.	

[ ]: Factory-set

NOTES:

- When the LAN controller does not provide network booting, set the option ROM for the LAN board to "Disabled".
- When connecting a hard disk containing the operating system to the disk array controller, set the slot of the disk array controller to "Enabled".

USB Function Submenu

Option	Parameter	Description	Your Setting
USB Function	[Enabled] Disabled	Enables or disables the onboard USB controller BIOS.	

[ ]: Factory-set

Onboard NIC 1 / Onboard NIC 2 Submenu

Option	Parameter	Description	Your Setting
Onboard NIC	[Enabled] Disabled	Enables or disables onboard LAN controller.	
Embedded NIC ROM	[Enabled] Disabled	Enables or disables onboard LAN controller expansion ROM.	

[ ]: Factory-set

Onboard SCSI Submenu

Option	Parameter	Description	Your Setting
Onboard SCSI	[Enabled] Disabled	Enables or disables onboard SCSI controller.	
Onboard SCSI ROM	[Enabled] Disabled	Enables or disables onboard SCSI controller expansion ROM.	

[ ]: Factory-set

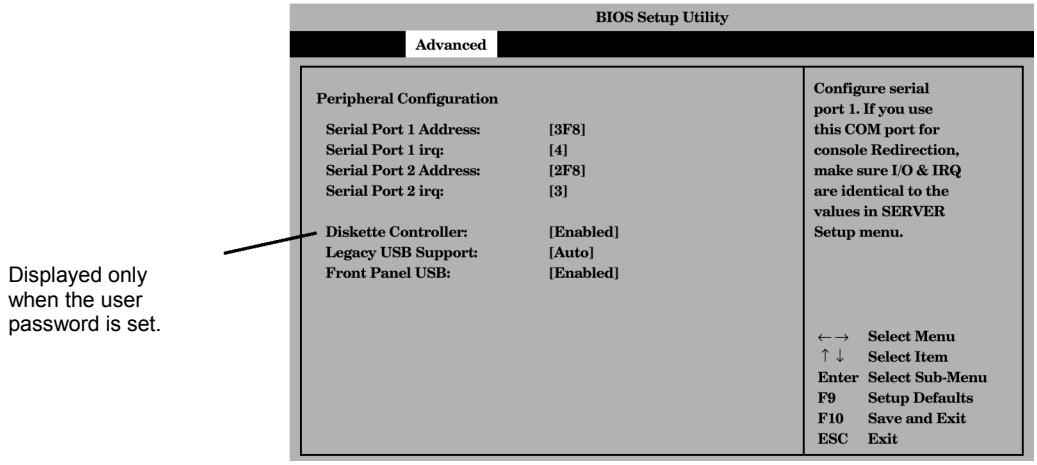
Onboard Video Submenu

Option	Parameter	Description	Your Setting
Onboard Video	[Enabled] Disabled	Enables or disables onboard video controller.	

[ ]: Factory-set

Peripheral Configuration

Select "Peripheral Configuration" on the Advanced menu to display the following screen.


BIOS Setup Utility
Advanced
Peripheral Configuration
Serial Port 1 Address: [3F8]
Serial Port 1 irq: [4]
Serial Port 2 Address: [2F8]
Serial Port 2 irq: [3]
Diskette Controller: [Enabled]
Legacy USB Support: [Auto]
Front Panel USB: [Enabled]
Configure serial port 1. If you use this COM port for console Redirection, make sure I/O & IRQ are identical to the values in SERVER Setup menu.
←→ Select Menu
↑↓ Select Item
Enter Select Sub-Menu
F9 Setup Defaults
F10 Save and Exit
ESC Exit
Displayed only when the user password is set.

See the table below for setup options on the screen.

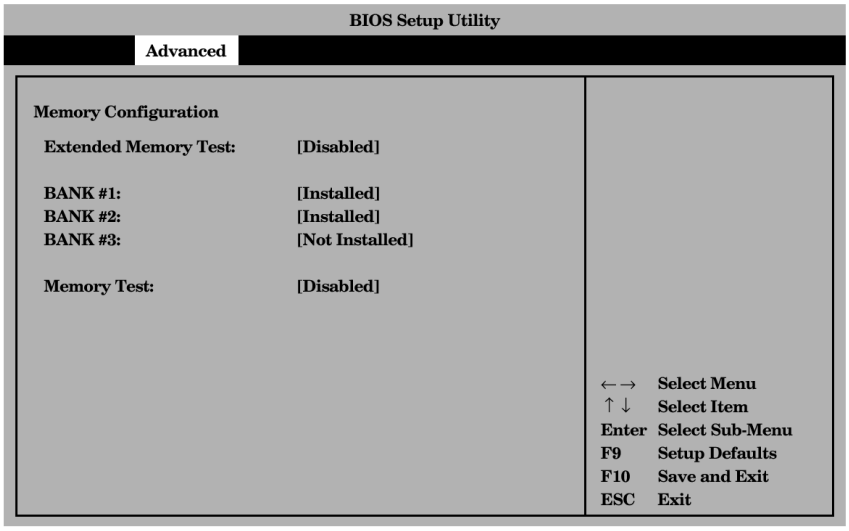
IMPORTANT: Avoid conflicts in the interrupt requests or base I/O addresses. If an assigned value is already used by another resource, it appears in yellow. Any yellow value must be re-assigned.

Option	Parameter	Description	Your Setting
Serial Port 1 Address	Disabled [3F8] 2F8 3E8 2E8	Used to configure the base I/O address for serial port 1.	
Serial Port 1 IRQ	[4] 3	Used to configure the interrupt for serial port 1.	
Serial Port 1 Address	Disabled 3F8 [2F8] 3E8 2E8	Used to configure the base I/O address for serial port 2.	
Serial Port 1 irq	4 [3]	Used to configure the interrupt for serial port 2.	
Diskette Write Protect	[Disabled] Enabled	Displayed only when the user password is set. Used to allow or inhibit writing into floppy disk.	
Diskette Controller	Enabled [Disabled]	Enables or disables onboard floppy disk controller BIOS.	
Legacy USB Support	[Disabled] Keyboard Only Auto Keyboard and Mouse	Disables or enables support for USB keyboards and mice. Always set to "Disabled" with this server.	
Front Panel USB	Disabled [Enabled]	Enables or disables the USB port on the front panel.	

[ ]: Factory-set

Memory Configuration

Select "Memory Configuration" on the Advanced menu to display the following screen.



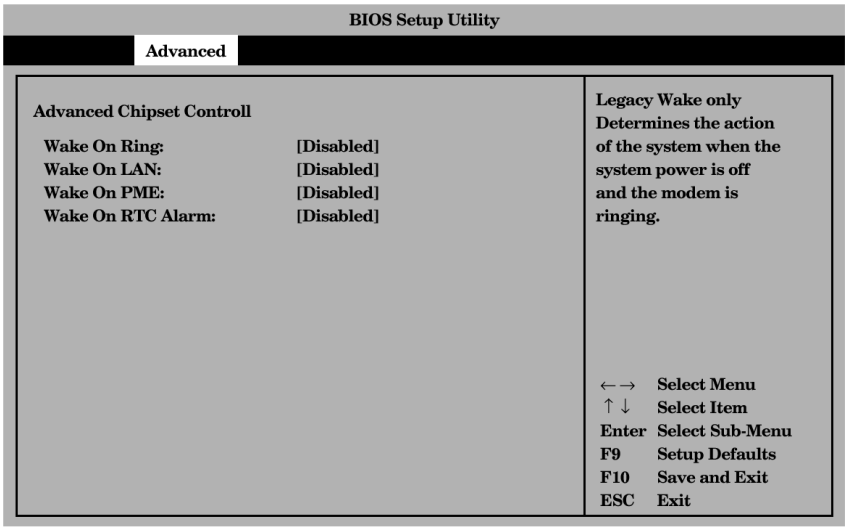
See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Extended Memory Test	1 MB 1 KB Every-Location [Disabled]	Extended memory test options run during POST. 1MB: Tests every 1-MB memory. 1KB: Tests every 1-KB memory. Every-Location: Tests every memory location. Disabled: Initializes memory. Note: the smaller the test unit, the longer the test takes during POST.	
DIMM Bank #1 - #3	Installed Disabled Not Installed	Indicates the current memory status. "Normal" indicates the normal status, "Error" indicates a memory error, and "None" indicates no DIMM installed (view only). Bank #1 indicates DIMMs in DIMM socket #1A and #1B. Bank #2 indicates DIMMs in DIMM Bank #2A and #2B. Bank #3 indicates DIMMs in DIMM Bank #3A and #3B. (Memory is interleaved and two DIMMs are used in pair.)	
Memory Retest	[Disabled] Enabled	Clears memory error information and retests all DIMMs on the next system boot. This option will be automatically reset to [Disabled] on the next system boot.	

[ ]: Factory-set

Advanced Chipset Control

Select "Advanced Chipset Control" on Advanced menu to display the following screen.



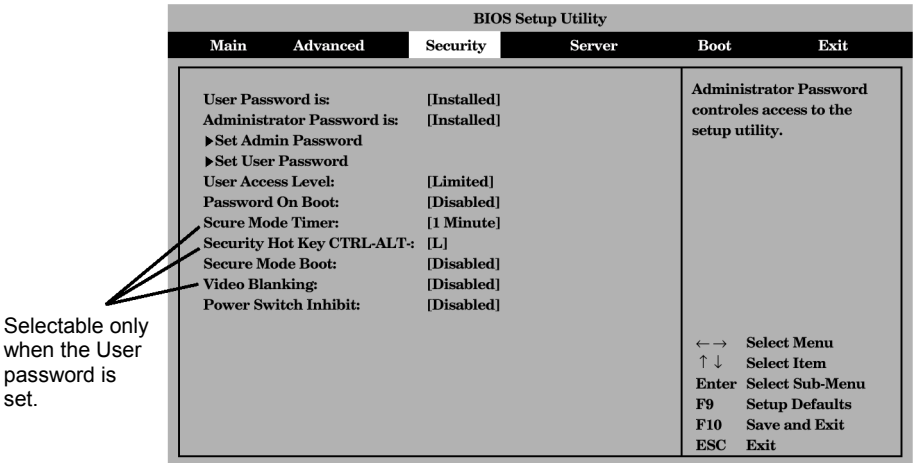
See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Wake on Ring	[Disabled] Enabled	Enables or disables the remote power-on features via serial port (modem).	
Wake on LAN	[Disabled] Enabled	Enables or disables the remote power-on features via network.	
Wake on PME	[Disabled] Enabled	Enables or disables the remote power-on features by PCI device (PCI Power Management Enable wake up event).	
Wake on RTC Alarm	[Disabled] Enabled	Enables or disables the remote power-on features using a RTC Alarm features.	

[ ]: Factory-set

Security

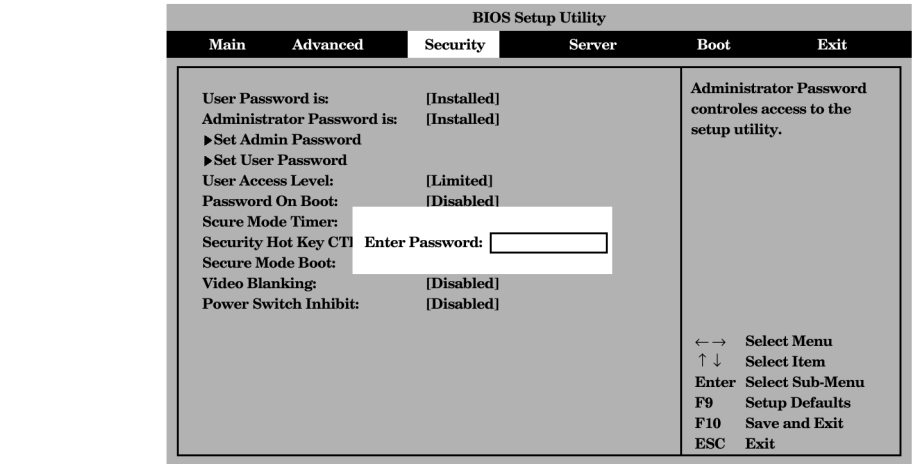
Move the cursor onto "Security" to display the Security menu.


BIOS Setup Utility
Main Advanced Security Server Boot Exit
User Password is: [Installed]
Administrator Password is: [Installed]
▸Set Admin Password
▸Set User Password
User Access Level: [Limited]
Password On Boot: [Disabled]
Scure Mode Timer: [1 Minute]
Security Hot Key CTRL-ALT-: [L]
Secure Mode Boot: [Disabled]
Video Blanking: [Disabled]
Power Switch Inhibit: [Disabled]
Administrator Password controles access to the setup utility.
←→ Select Menu
↑↓ Select Item
Enter Select Sub-Menu
F9 Setup Defaults
F10 Save and Exit
ESC Exit
Selectable only when the User password is set.

Select "Set Administrator Password" or "Set User Password" and press **Enter** to display the following pop-up screen.

The screen below shows when "Set Administrator Password" is selected.

Set a password on this pop-up screen. Enter a password of up to seven alphanumeric characters and symbols from the keyboard.



IMPORTANT:

- User password setup is not available before Administrator password setup.
- Do not set any password before installing the OS.
- If you forget any password, consult with your sales representative.

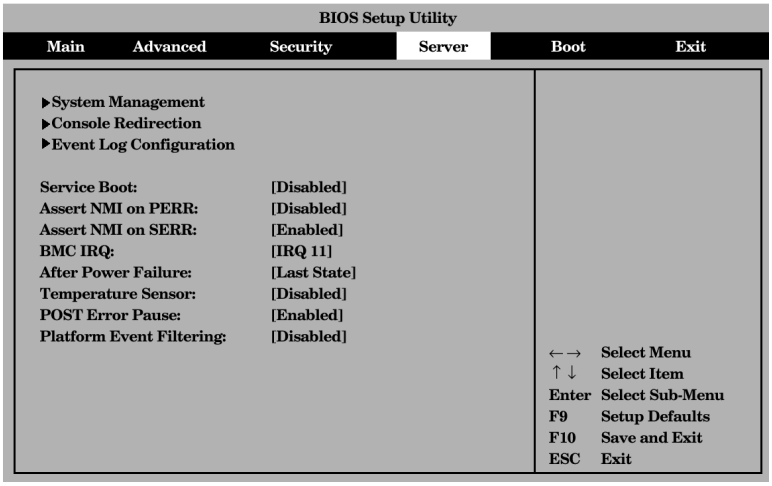
See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
User Password is	Installed Not Installed	Indicates whether the user password is set or not (view only).	
Administrator Password is	Installed Not Installed	Indicates whether the administrator password is set or not (view only).	
Set Administrator Password	Up to 7 alphanumeric characters	Press **Enter** to display the administrator password entry screen. With the administrator password, all SETUP menus are available for access. This option is available only when you log into the SETUP utility with the administrator password.	
Set User Password	Up to 7 alphanumeric characters	Press **Enter** to display the user password entry screen. With a user password, accessible SETUP menus are restricted. This option is available only if the Administrator Password is specified.	
User Access Level	Limited No Access View Only Full	Sets the User access level when logged in with user password. When set to "Full", the system does not enter secure mode.	
Password On Boot	[Disabled] Enabled	Specify whether to request a password entry at boot-up. Administrator password setup is required beforehand. When the administrator password is specified and this option is disabled, the BIOS assumes that a system boot attempt is made by a user.	
Secure Mode Timer	[1 minute] 2 minutes 5 minutes 10 minutes 20 minutes 60 minutes 120 minutes	Set the period from no input from the keyboard or mouse to the point at which the system enters into the secure mode. If this item is set to "Disabled," the system does not enter the secure mode.	
Security Hot Key CTRL-ALT-	[L] Z	Specify the hot key to invoke secure mode features. Pressing the assigned key along with **Ctrl** and **Alt** invoke secure mode. This option is enabled when User Password is set.	
Secure Mode Boot	[Disabled] Enabled	Specify whether the system boots in secure mode. This option is enabled when User Password is set.	
Video Blanking	[Disabled] Enabled	Specify whether to turn off the monitor when secure mode is activated.	
Power Switch Inhibit	[Disabled] Enabled	Enables or disables the POWER switch. If "Enabled" is selected, power-off with the POWER switch becomes unavailable after OS boot-up. (Forced shut down also becomes unavailable. Forced shut down is a feature to shut down by pressing the POWER switch for at least four seconds.)	

[ ]: Factory-set

Server

Move the cursor onto "Server" to display the Server menu.



The table below lists options that you can specify on the Server menu screen and their functions. To make a selection for "System Management", "Console Redirection", and "Event Log Configuration", first select a desired option and press **Enter** to display its submenu.

See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Service Boot	Enabled [Disabled]	Specifies whether to boot directly to System Management menu at system start-up.	
Assert NMI on PERR	[Disabled] Enabled	Sets support of PCI PERR.	
Assert NMI on SERR	Disabled [Enabled]	Sets support of PCI SERR.	
BMC IRQ	Disabled IRQ 5 [IRQ 11]	Sets the BMC IRQ.	
After Power Failure	Stays Off [Last State] Power On	Sets the AC-LINK feature. Determines the mode of operation if a power loss occurs. (See the table below.)	
Temperature Sensor	[Disabled] Enabled	Enables or disables temperature sensor monitoring feature.	
POST Error Pause	Disabled [Enabled]	Specifies whether the system waits for user intervention on critical POST errors or not.	
Platform Event Filtering	[Disabled]	Enables or disables triggers for system sensor events inside the Baseboard Management Controller (BMC).	

[ ]: Factory-set

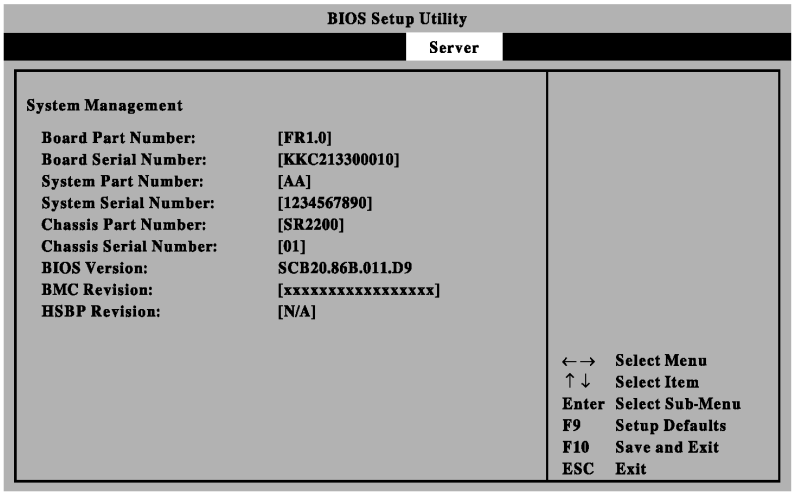
The table below lists how selections for "After Power Failure" determine the power status of the server when the power supply to the server restarts.

State before powered off	Parameter		
	Stays Off	**Last State**	**Power On**
In service	Off	On	On
Out of service (DC power: Off)	Off	Off	On
Forced shutdown *	Off	Off	On

* Pressing the POWER switch for at least four seconds shuts down the power to the server.

System Management Submenu

Select "System Management" on the Server menu and press **Enter** to display the following screen.



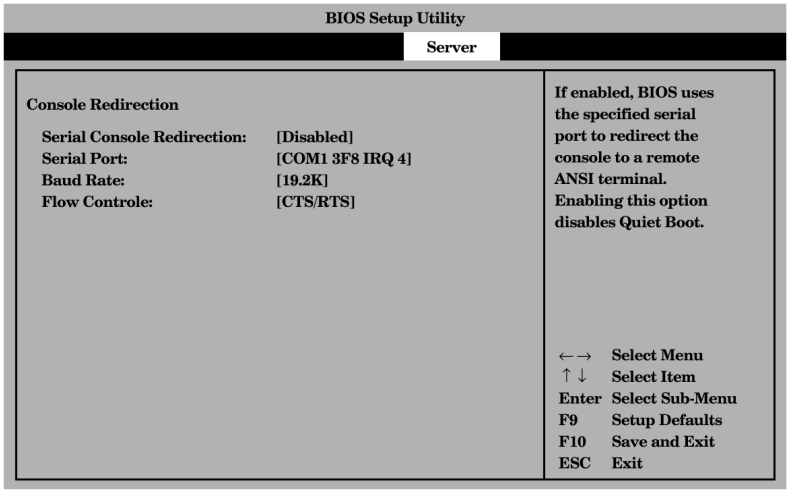
See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Board Part Number	–	Indicates the part number of system board. (View only)	
Board Serial Number	–	Indicates the serial number of system board. (View only)	
System Part Number	–	Indicates the system part number. (View only)	
System Serial Number	–	Indicates the serial number of system. (View only)	
Chassis Part Number	–	Indicates the part number of chassis. (View only)	
Chassis Serial Number	–	Indicates the serial number of chassis. (View only)	
BIOS Revision	–	Indicates BIOS revision number. (View only)	
BMC Revision	–	Indicates BMC (Baseboard Management Controller) revision number. (View only)	
HSBP Revision	–	Indicates HSBP (Hot-Swap backplane) revision number. (View only)	

[ ]: Factory-set

Console Redirection

Select "Console Redirection" on the Server menu and press **Enter** to display the following screen.


BIOS Setup Utility
Server
Console Redirection
Serial Console Redirection: [Disabled]
Serial Port: [COM1 3F8 IRQ 4]
Baud Rate: [19.2K]
Flow Controle: [CTS/RTS]
If enabled, BIOS uses the specified serial port to redirect the console to a remote ANSI terminal. Enabling this option disables Quiet Boot.
← → Select Menu
↑ ↓ Select Item
Enter Select Sub-Menu
F9 Setup Defaults
F10 Save and Exit
ESC Exit

See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Serial Console Redirection	[Disabled] Enabled	Specifies whether BIOS uses the specified serial port to redirect the console to MWA or remote terminals using hyper terminal. Disable the Quiet Boot option in BOOT menu.	
Serial Port	COM1 3F8 IRQ4 COM2 2F8 IRQ3	Selects an address/interrupt for the serial port used for redirection. Make sure to use the same address/interrupt as specified in [Advanced] - [Peripheral Configuration].	
Baud Rate	9600 [19.2k] 38.4k 115.2k	Selects a baud rate for communications with the connected HW console. [56k] is not available.	
Flow Control	No Flow Control [CTS/RTS] XON/XOFF CTS/RTS+CD	Select a flow control method.	

[ ]: Factory-set

Event Log Configuration Submenu

Select "Event Log Configuration" on the Server menu and press **Enter** to display the following screen.

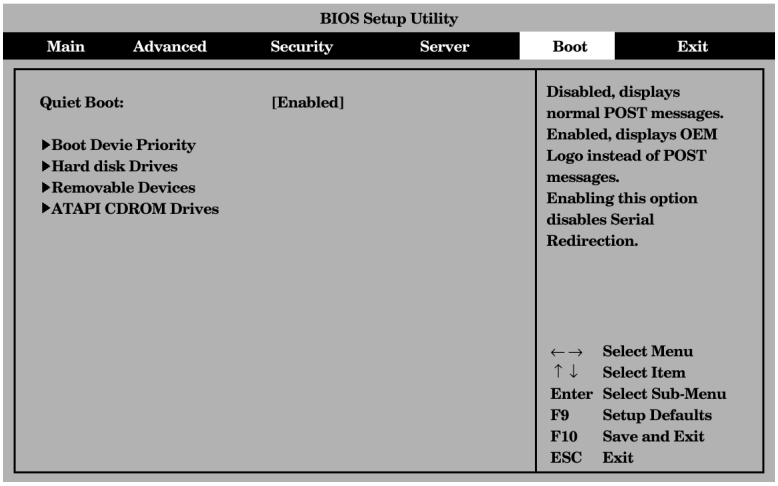
See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Clear All Event Logs	[No] Yes	Clears the DMI event log after a system reboot.	
Event Logging	[Enabled] Disabled	Specifies whether all systems events are logged or not.	
Critical Event Logging	[Enabled] Disabled	Specifies whether to detect and log event at system critical errors. Critical errors are fatal to system operation. These errors include PERR, SERR, ECC, Memory errors and NMI.	

[ ]: Factory-set

Boot

Move the cursor onto "Boot" to display the Boot menu. Available options in the Boot menu and descriptions are described below. To make a selection for "Boot Device Priority", "Hard Drive", "Removable Devices", and "ATAPI CDROM Drives", first select a desired option and press **Enter** to display its submenu.



See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Quiet Boot	Disabled [Enabled]	If disabled, displays normal POST messages. If enabled, displays NEC Logo instead of POST messages. Enabling this option disables console redirection.	

[ ]: Factory-set

Boot Device Priority

The system searches for the boot device according to the order specified in this menu and use the software to boot the system if found.

Move the cursor to select the device by ↑ or ↓, and then change the priority using + or –.

IMPORTANT:

- To start NEC EXPRESSBUILDER, specify "ATAPI CD-ROM Drive" to 1st Boot Device, and "Removable Devices" to 2nd Boot Device.
- LAN port 1 and LAN port 2 are displayed with the same name. LAN port 1 is determined according to priority after [Load Setup Defaults] is executed or factory-set (4th Boot Device).
- For LAN device that does not boot with PXE, specify "Disabled" for [Advanced] - [PCI Configuration] - [Onboard NIC 1], [Onboard NIC 2], and PCI slot containing optional LAN board.

Option	Parameter	Description	Your Setting
1st Boot Device	Removable Devices	Attempts to boot from a removable media device.	
2nd Boot Device	ATAPI CD-ROM Drive	Attempts to boot from an ATAPI CD-ROM drive.	
3rd Boot Device	Hard Drive	Attempts to boot from a hard drive device.	
4th Boot Device	Intel Boot Agent ver	Attempts to boot from a network (PXE boot).	
5thBoot Device	Intel Boot Agent ver	Attempts to boot from a network (PXE boot).	

Hard Disk Submenu

Set the boot priority of hard disks being connected to the server. The system searches for the boot device according to the order specified in this submenu and use the software to boot the system if found.

Move the cursor to select the device by ↑ or ↓, and then change the priority using + or –.

Item	Description
1. Drive #1 (or actual drive name)	"Other bootable cards" cover all the boot devices not reported to the system BIOS through BIOS Boot Specification mechanisms. It may or may not be bootable, and may not correspond to any device.
2. Other bootable cards	

Removable Devices Submenu

Select the removable device used to boot the system. The system searches for the boot device according to the order specified in this submenu and use the software to boot the system if found.

Move the cursor to select the device by ↑ or ↓.

Item	Description
Lists Bootable Removable devices in the system.	Select one of the detected devices. This list includes legacy 1.44-MB floppy drives and 120-MB floppy drives.

ATAPI CD-ROM Drives Submenu

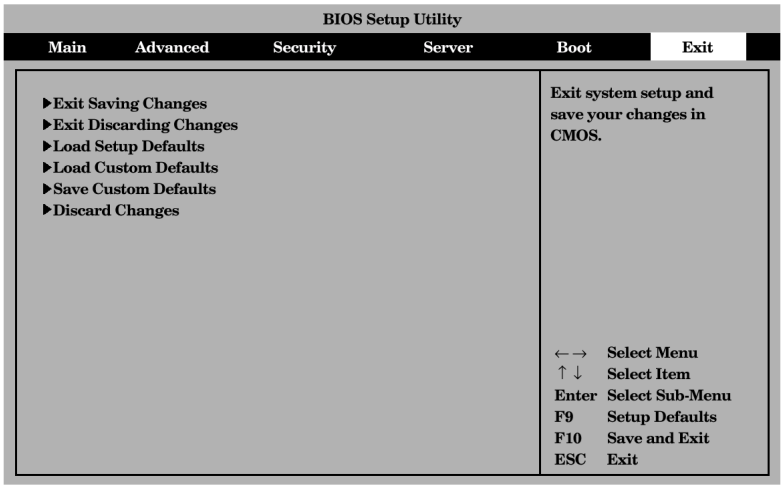
Select the CD-ROM drive used to boot the system. The system searches for the boot device according to the order specified in this submenu and use the software to boot the system if found.

Move the cursor to select the device by ↑ or ↓.

Item	Description
Lists Bootable Removable devices in the system.	Select one of the detected devices. This includes any ATAPI CD-ROM Drive installed.

Exit

Move the cursor onto "Exit" to display the Exit menu.



The following describes each option on the Exit menu:

- Exit Saving Changes

  Select this option to save the current configuration data into the CMOS (non-volatile memory) and exit the SETUP utility.

  Select "Yes" to save the current configuration data into the CMOS (non-volatile memory) and exit the SETUP utility. The server will automatically restart the system.

- Exit Discarding Changes

  Select this option to discard the current configuration data and exit the SETUP utility.

  Select "Yes" to discard the current configuration data and exit the SETUP utility, and restart the server automatically. Select "No" to return to Exit menu.

- Load Setup Defaults

  Select this option to resume all default values (BIOS default values) of the SETUP utility.

  Select "Yes" to resume default values. Select "No" to return to the Exit menu screen. If you resumed the default values, you need to change settings as described below to operate the system normally.

  - [Advanced] - [Peripheral Configuration] - [Legacy USB Support] - [Disabled]
  - [Boot] - [Boot Device Priority] - [ATPI CD-ROM Drive] - [1st Boot Device]
  - [Boot] - [Boot Device Priority] - [Removable Drive] - [2nd Boot Device]
  - [Boot] - [Hard Disk] and set the boot priority.

- Load Custom Defaults

  Select this option and press **Enter** to load the custom defaults saved from previous Save Custom Defaults.

- Save Custom Defaults

  Select this option and press **Enter** to save the current configuration data as custom defaults. When the configuration is saved, the Load Custom Defaults menu appears.

- Discard Changes

  Select this option to discard any changes made to BIOS settings and restore the previous settings.

  Select "Yes" to discard the current settings.

SCSI BIOS ~ SCSI*Select* ~

The SCSI*Select* utility is provided to configure the SCSI controller on the system board (or the SCSI controller on an optional board). This utility may be started with a simple key operation while POST is in progress and requires no specific start-up disk.

Using SCSI*Select* Utility

Use the SCSI*Select* utility mainly to set the transfer speed of connected SCSI devices. The SCSI devices include those installed in the 5.25-inch device bays and backup devices, such as an external DAT and MO, but not hard disks.

> **IMPORTANT:** SCSI configuration must be made on a per-SCSI controller basis with a utility. The server contains one SCSI controller. When you added optional SCSI controllers, you need to make configuration for each SCSI controller in addition to the standard internal SCSI controller. Some additional SCSI controllers may require a different utility to make changes to the configuration.

Configuring SCSI Controller on Mother Board

The following describes configuration for the SCSI controller on the system board of the server.

> **IMPORTANT:** The server contains the latest version of the SCSI*Select* utility. Dialog boxes appear on your SETUP utility, thus, may differ from descriptions in this User's Guide. If you find anything unclear, see the online help or ask your sales representative.

Procedure from Start-up to Exit

The following describes the procedure from starting to exiting the SCSI*Select* utility. For parameter descriptions, see the section "Parameters" described later.

1. Power on the Express server.

   The following message appears while POST is in progress.

   IMPORTANT: The message appears for each additional SCSI controller.

   ```
   Adaptec AIC-7899 SCSI BIOS V 2.55
   (c) 1999 Adaptec, Inc. All Rights Reserved

   ◀ ◀ ◀ Press <Ctrl> <A> for SCSISelect(TM) Utility! ▶ ▶ ▶
   ```

2. Press and hold **Ctrl** and **A**.

   The SCSI*Select* utility starts and its Main menu appears.

3. Select "01:06:A" or "01:06:B" in the "Bus:Device" box with the cursor keys and press **Enter**.

   ```
   You have an AIC-7899                  Bus:Device:Channel
   SCSI host adapter in your system. Move      01:06:A
   the cursor to the bus:device:channel of     01:06:B
   the one to be configured and
   press <Enter>.

   <F5> - Toggle color/monochrome
   ```

   The system board is provided with two SCSI controller channels. Channel B (01:06:B) indicates the Ultra-160/m SCSI connector (for hard disks); and Channel A (01:06:A) indicates the Wide Ultra 2 SCSI connector (for 5.25-inch devices and external SCSI devices).

   Select the device number in the "Bus:Device" box and press **Enter**.

   The Options menu appears.

4. Select "Configure/View Host Adapter Settings" and press **Enter**.

   ```
   Options
   Configure/View Host Adapter Settings
   SCSI Disk Utilities
   ```

The Configuration menu appears.

```
Configuration
SCSI Bus Interface Definitions
Host Adapter SCSI ID ..... 7
SCSI Parity Checking ..... Enabled
Host Adapter SCSI Termination..... Enabled

Additional Options
Boot Device Options ..... Press<Enter>
SCSI Device Configuration ..... Press<Enter>
Advanced Configuration Options ..... Press<Enter>

<F6> - Reset to Host Adapter Defaults
```

5. Select a parameter for each menu item.

   See the section "Parameters" described later to set an appropriate parameter for each menu item.

6. After completing the parameter settings, press **Esc** repeatedly until the following save message appears.

   ```
   Save Changes Made?
   ```

7. If the configuration data is correct, select "Yes" and press **Enter**.

8. Press **Esc** repeatedly until the following exit message appears.

   ```
   Exit Utility?
   ```

9. Select "Yes" and press **Enter** to exit.

Parameters

The SCSI*Select* utility to configure the internal SCSI controller of the server has the following menu items and parameters. Read descriptions to select a correct parameter for each menu item. For configuration of optional SCSI controllers and connected SCSI devices, see the section "Configuring SCSI Controller on Optional Board" described later.

SCSI Bus Interface Definitions

To set three menu items under "SCSI Bus Interface Definitions", select a menu item with the cursor keys (↓ or ↑) and press **Enter** to fix the item. Use the cursor keys (↓ or ↑) for parameter selection. The following table lists menu items, available parameters, and descriptions.

Menu item	Parameter	Description
Host Adapter SCSI ID	0 - [7] - 15	Select "7".
SCSI Parity Checking	[Enabled] Disabled	Select "Enabled".
Host Adapter SCSI Termination	[Enabled] Disabled	Enable or disable the SCSI termination. Select "Enabled".

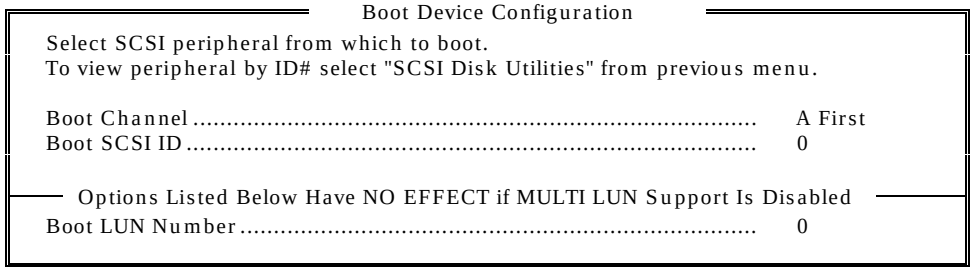
[ ]: Factory-set

Additional Options

To set three menu items under "Additional Options", select a menu item with the cursor keys (↓ or ↑) and press **Enter** to display its submenu. Then, select a submenu item with the cursor keys (↓ or ↑) and press **Enter** to fix the item. Use the cursor keys (↓ or ↑) for parameter selection.

■ Boot Device Options

Move the cursor onto "Boot Device Options" and press **Enter** to display the following submenu.


Boot Device Configuration
Select SCSI peripheral from which to boot.
To view peripheral by ID# select "SCSI Disk Utilities" from previous menu.
Boot Channel ..... A First
Boot SCSI ID 0
Options Listed Below Have NO EFFECT if MULTI LUN Support Is Disabled
Boot LUN Number 0

The following table lists submenu items, available parameters, and descriptions.

Submenu item	Parameter	Description
Boot Channel	[A First] B First	Select "A First".
Boot SCSI ID	[0] - 15	Select "0".
Boot LUN Number	[0] - 7	Select "0".

[ ]: Factory-set

■ SCSI Device Configuration

Move the cursor onto "SCSI Device Configuration" and press **Enter** to display the following submenu.

SCSI Device Configuration

SCSI Device ID	#0	#1	#2	#3	#4	#5	#6	#7
Sync Transfer Rate (MB/Sec)	160	160	160	160	160	160	160	160
Initiate Wide Negotiation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enable Disconnection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Send Start Unit Command	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Options Listed Below Have NO EFFECT if the BIOS is Disabled								
Enable Write Back Cache	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
BIOS Multiple LUN Support	No	No	No	No	No	No	No	No
Include in BIOS Scan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

SCSI Device ID	#8	#9	#10	#11	#12	#13	#14	#15
Sync Transfer Rate (MB/Sec)	160	160	160	160	160	160	160	160
Initiate Wide Negotiation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enable Disconnection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Send Start Unit Command	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Options Listed Below Have NO EFFECT if the BIOS is Disabled								
Enable Write Back Cache	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
BIOS Multiple LUN Support	No	No	No	No	No	No	No	No
Include in BIOS Scan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

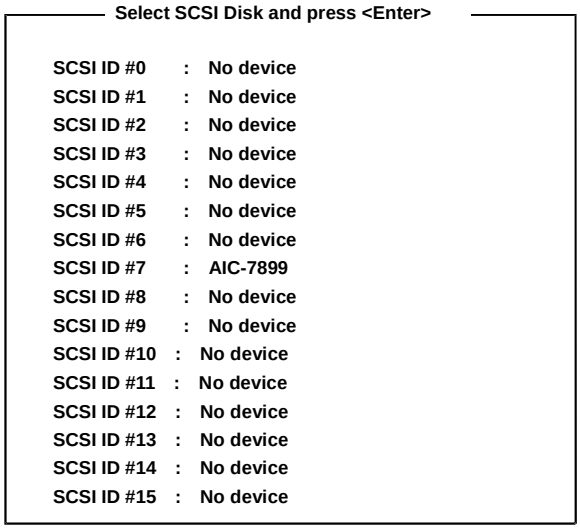
The following table lists submenu items, available parameters, and descriptions.

IMPORTANT: Select a parameter for each submenu item on a per-SCSI ID basis. Verify the SCSI ID of a desired device before configuration.

NOTE: To find out the SCSI ID for the optional device connected, select "SCSI Disk Utilities" on the Options menu and press **Enter**. The SCSI ID scan begins displaying the message as shown below.

```
Scanning SCSI ID : 0    LUN Number : 0
```

When the SCSI ID scan completes, the screen listing SCSI IDs and associated devices appears.


Select SCSI Disk and press <Enter>
SCSI ID #0 : No device
SCSI ID #1 : No device
SCSI ID #2 : No device
SCSI ID #3 : No device
SCSI ID #4 : No device
SCSI ID #5 : No device
SCSI ID #6 : No device
SCSI ID #7 : AIC-7899
SCSI ID #8 : No device
SCSI ID #9 : No device
SCSI ID #10 : No device
SCSI ID #11 : No device
SCSI ID #12 : No device
SCSI ID #13 : No device
SCSI ID #14 : No device
SCSI ID #15 : No device

Find out the SCSI ID for the installed optional on this screen. You can also view the device information by selecting a device and pressing **Enter**.

Submenu item	Parameter	Description
Sync Transfer Rate (MB/Sec)	[160] 20.0 80.0 16.0 53.4 13.4 40.0 10.0 32.0 ASYN 26.8	Select [160] as a recommended. You may need to change the value depending on your optional device. Refer to the manual that comes with your optional device.
Initiate Wide Negotiation	[Yes] No	Select "Yes" if your SCSI device supports the Wide SCSI interface. Select "No" if not.
Enable Disconnection	[Yes] No	Select "Yes".
Send Start Unit Command	[Yes] No	Select "Yes" to send the command to the hard disk. Otherwise select "No".
Enable Write Back Cache	Yes No [N/C]	Select "N/C".
BIOS Multiple LUN Support	Yes [No]	Select "No".
Include in BIOS Scan	[Yes] No	Select "Yes".

[ ]: Factory-set

- Advanced Configuration Options

  Move the cursor onto "Advanced Configuration Options" and press **Enter** to display the following submenu.

```
Advanced Configuration Options
Reset SCSI Bus at IC Initialization ..... Enabled
Display <Ctrl><A> Message During BIOS Initialization..... Enabled
Extended BIOS Translation for DOS Driver > 1 GByte..... Enabled
Verbose/Silent Mode..... Verbose

Options Listed Below Have NO EFFECT if MULTI LUN Support Is
Disabled
Host Adapter BIOS..... Enabled
Domain Validation ..... Enabled
Support Removable Disks Under BIOS as Fixed Disks..... Disabled
BIOS Support for Bootable CD-ROM..... Enabled
BIOS Support for Int13 Extensions..... Enabled
```

The following table lists submenu items, available parameter, and descriptions.

Submenu item	Parameter	Description
Reset SCSI Bus at IC Initialization	[Enabled] Disabled	Select "Enabled".
Display <Ctrl><A> Message During BIOS Initialization	[Enabled] Disabled	Select "Enabled".
Extended BIOS Translation for DOS Driver > 1 GByte	[Enabled] Disabled	Select "Enabled".
Verbose/Silent Mode	[Verbose] Silent	Select "Verbose".
Host Adapter BIOS	[Enabled] Disabled: NOT Scan Disabled: scan bus	Enable or disable SCSI BIOS. Select "Enabled" for most cases other than the following: • To boot the OS from a hard disk connected to an optional SCSI controller. (If the optional SCSI controller has no hard disks connected, however, select "Enabled".) • BIOS the SCSI controller may be disabled to reserve an area in the expansion ROM space if the controller has no hard disks connected.
Domain Validation	[Enabled] Disabled: NOT Scan Disabled: scan bus	Enable or disable SCSI BIOS. Select "Enabled".
Support Removable Disks under BIOS as Fixed Disks	[Boot Only] All Disks [Disabled]	Select "Boot Only" if "01:06:A" is selected for "Bus:Device:Channel". Select "Disabled" if "01:06:B" is selected. When the default configuration is resumed, "Boot Only" is selected for both channels. In such a case, change the parameter for "01:06:B" to "Disabled".
BIOS Support for Bootable CD-ROM	[Enabled] Disabled	Select "Enabled".
BIOS Support for Int 13 Extension	[Enabled] Disabled	Select "Enabled".

[ ]: Factory-set

Configuring SCSI Controller on Optional Board

To configure SCSI devices connected to an optional SCSI controller board, use the SCSI BIOS utility provided with the optional SCSI controller board.

Refer to the manual that comes with the optional SCSI controller board for details.

When the server has multiple SCSI controller boards installed, the server first displays the start-up message of the SCSI*Select* utility for the SCSI controller on the system board. It then displays the utility start-up message for additional SCSI controllers one by one. The start-up message appears in order of the PCI board slot numbers of the riser card for low-profile type and the riser card for full-height type. The message displayed may vary depending on the optional SCSI controller board. Refer to the manual that comes with the optional SCSI controller board for details.

CONFIGURING MOTHER BOARD JUMPERS

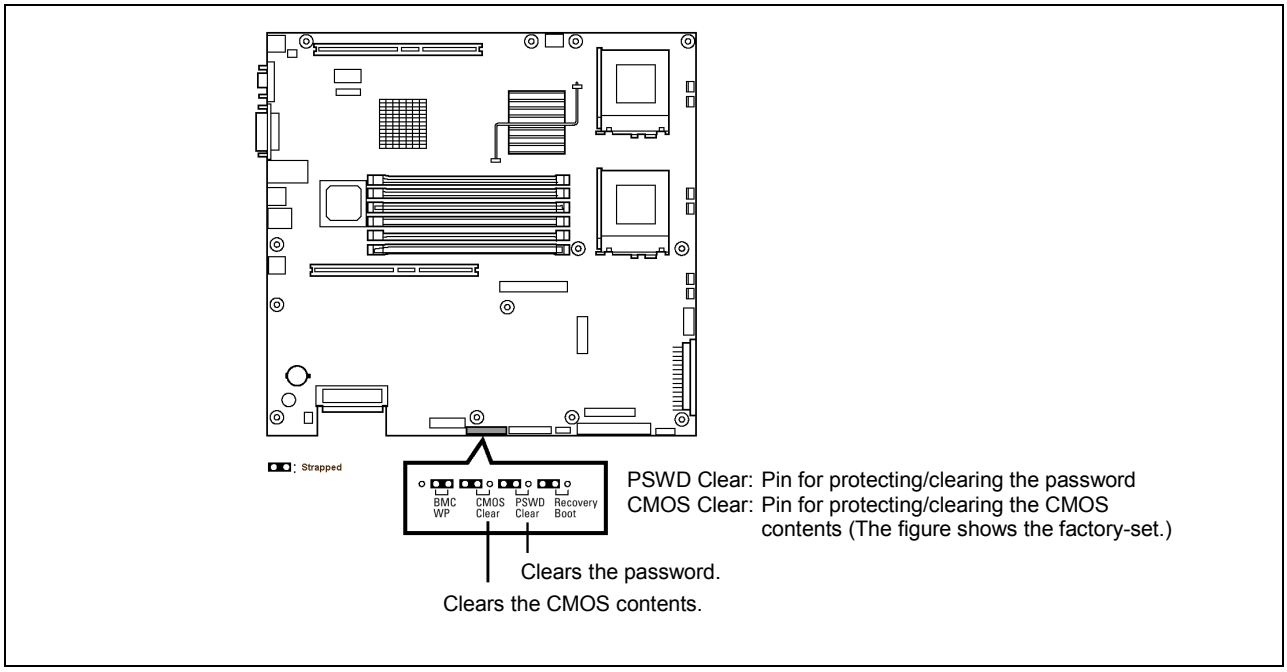
With the pre-installed SETUP utility, you can set desired passwords to protect the data stored in the server against access from unauthorized users. When you forget the passwords, however, you may want clear them. The following describes how to clear these passwords. You can also use the following procedure to clear the CMOS data in the server.

IMPORTANT: Clearing the CMOS data resumes the factory-set configuration data. After clearing the CMOS contents, change the setting as shown below. This setting is necessary for operating the server correctly.

- Select [Advanced] → [Peripheral Configuration] → [Legacy USB Support] → [Disabled].
- Select [Boot] → [Boot Device Priority] → [ATAPI CD-ROM Drive] → [1st Boot Device].
- Select [Boot] → [Boot Device Priority] → [Removable Drive] → [2nd Boot Device].
- Select [Boot] → [Hard Disk], and set the boot order.

To clear passwords or the CMOS data, use the jumper switch on the system board of the server. The following figure illustrates the jumper switch location.

IMPORTANT: Do not change any other switch settings. Any change may cause the server to fail or malfunction.


: Strapped
BMC WP
CMOS Clear
PSWD Clear
Recovery Boot
PSWD Clear: Pin for protecting/clearing the password
CMOS Clear: Pin for protecting/clearing the CMOS contents (The figure shows the factory-set.)
Clears the password.
Clears the CMOS contents.

The following describe the clearing procedure.

⚠ WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury.

- Do not disassemble, repair, or alter the server.
- Do not remove the lithium battery.
- Do not connect the ground line to a gas pipe.

⚠ CAUTION



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury.

- Do not lift the server by yourself. Two people are required to lift this server.
- Make sure to complete board installation before closing the server.
- Do not install the server in a rack with leaving covers removed.
- Do not pinch your finger within the mechanical components of the server.
- High temperature can result if the server is operated with the covers removed.
- Do not pull a device out of the rack if the rack is unstable.
- Do not pull more than one device out of the rack at one time.

1. Loosen the thumbscrews and pull the server out from the rack.
2. Unlock and remove the front bezel, power down the server and open the top cover.
3. Change the setting of the jumper switch of the target function to clear (PSWD or CMOS Clear).

   IMPORTANT: Be careful not to lose the clip.

4. Close up the server, and press the POWER switch.

   The following messages are displayed at completion of POST:

```
ERROR:
0120: NVRAM cleared By jumper

Press <F1> to Resume, Press <F2> to run SETUP.
```

5. Press the **F2** key to activate the SETUP utility.
6. Select [Exit Saving Changes] from the [Exit] menu, and then [Yes].
7. Wait until the message "Turn off power and reinstall the jumper in Normal mode position" appears.
8. Turn off the system power switch.
9. Change the jumper switch setting back to the original position, turn on the power, and then define the setting by using the BIOS SETUP utility.

(This page is intentionally left blank.)

Chapter 4

Installing the Operating System

This section describes how to use Express Setup to install and configure the following operating systems on your server.

- Microsoft® Windows® 2000
- Microsoft Windows NT® 4.0
- Novell® NetWare® (Version 5.0)
- SCO® Unix 5.0

To install operating systems not described in this section, contact your service representative.

> **IMPORTANT:** Before installing the operating system, adjust the system date and time by using the BIOS SETUP utility "SETUP." See Chapter 3 for detail.

About Express Setup

"Express Setup" contained on your EXPRESSBUILDER CD is intended for initial setup of the server. Its automatic installation mode guides the user through the process by detailing specific hardware features and providing screen prompts for software selection and configuration. "Express Setup" loads the utilities and drivers, applies RAID settings, partitions the disk, and installs the desired operating system.

IMPORTANT: Express Setup is intended for the initial setup of the server system. Therefore, it clears any prior content of the hard disk.



For Microsoft Windows 2000 and Windows NT 4.0, Express Setup automatically configures your server and installs the operating system. After some initial setup, you need to remove the EXPRESSBUILDER CD and insert the Windows CD, input a product ID number, and acknowledge the license agreement.

For Novell NetWare and the other operating systems, Express Setup initializes the target disk(s), creates the maintenance partition, and installs the various maintenance utilities from the EXPRESSBUILDER CD to prepare your server to a ready-to-install state for the desired operating system.

Express Setup requires a configuration diskette. The configuration diskette is a floppy disk that includes the configuration information for the server to be automatically installed. Express Setup automatically performs the setup using the information from the floppy disk.

Express Setup includes two types of installation methods.

- Quick start

  Quick start uses a configuration diskette with configuration parameters for the server which were pre-specified before starting the Express Setup. Configuration parameters can be pre-specified by using Express Setup for Windows (see the EXPRESSBUILDER User's Guide located on the EXPRESSBUILDER CD).

- Normal start

  Normal start creates the configuration diskette during Express Setup.

NOTES:

- To perform Express Setup, BIOS Setup must prioritize the CD-ROM drive as the first boot up device before the diskette drive and hard drive.
- You can create the configuration diskette in advance using "Express Setup for Windows" included on EXPRESSBUILDER.
- By creating the configuration diskette in advance, fewer parameters need to be entered during Express Setup. You can also create or modify the setup information stored on the configuration diskette during Express Setup. If you have a computer other than Express5800 server that is running Windows 95/98, Windows NT 3.51 or later, or Windows 2000, we recommend you edit the setup information from the computer in advance using Express Setup for Windows.

For more information on how to create the configuration diskette using Express Setup for Windows, see Chapter 5.

Microsoft Windows 2000

This subsection provides information on installing Microsoft® Windows® 2000 on your server. Read the instructions in this section before performing the installation.

> **NOTE:** To install Windows 2000 without using Express Setup, see Appendix C.

Installation Notice

This section explains precautions and provides information you should be aware of before beginning the installation of Windows 2000.

Supported OS on this model

The server supports the following Windows 2000 versions:

- Microsoft Windows 2000 Server version (hereinafter referred to as "Windows 2000.")
- Microsoft Windows 2000 Advanced Server version (hereinafter referred to as "Windows 2000.")

To install Windows NT 4.0, see the next subsection in this chapter. To install other operating systems, contact your service representative.

BIOS Specification

Before installing Windows 2000, confirm that the BIOS setup of the hardware is correct. In BIOS Setup, there are specific settings required for new functionality provided from Windows 2000 (Plug and Play, support for USB interface and so on). See Chapter 3 for information on making changes to the BIOS settings.

Windows 2000

Express Setup can install the Windows 2000 operating system. However, note the following:

IMPORTANT:

- Before starting the installation of Windows 2000, all optional boards should be added to the system and all BIOS settings should be checked to ensure they are set to the required parameters.
- Use this User's Guide when installing Windows 2000 on this server system. Do not use the installation guide for installing Windows 2000 that may be packaged with software not supplied with this system.

Installing Windows 2000 on a Mirrored Volume

If you want to install Windows 2000 on a volume that has been mirrored using "Disk Management", you must invalidate the mirror before re-installing the system on a basic disk, and reconfigure the mirror after the installation has completed.

Management of a mirror volume can be performed from "Disk Management" under "Computer Management."

Specifying Partition Size

The minimum size of the partition that is required when installing the operating system can be calculated from the following formula.

1000MB + Paging File Size + Dump File Size, where:

1000MB	= Size necessary to install the operating system
Paging File Size (Recommended)	= Installed Memory Size × 1.5
Dump file Size	= Installed Memory Size + 12MB

IMPORTANT:

- The paging file size is necessary for collecting debug information (memory dump). If you set the initial value of paging file size smaller than the 'recommended' value, you may not be able to collect accurate debug information (memory dump).
- If you want to install Microsoft Windows 2000 Advanced Server on a system with more than 4GB of memory installed, we recommend you increase the default paging file size by 2060MB.
- The dump file size for a system with more than 2GB memory installed is '2048MB + 12MB'.

For example, if the installed memory size is 512MB, the minimum required partition size would be as follows:

1000MB + (512MB × 1.5) + (512MB + 12MB) = 2292MB

NOTES:

To install the operating system using Express Setup, calculate the minimum required partition size as follows:

- If not applying a Windows 2000 Service Pack:
  The larger of: 'Minimum Partition Size' described above, or '2000MB'.
- If applying a Windows 2000 Service Pack:
  The larger of: 'Minimum Partition Size' described above + 850MB, or '4095MB'.

Re-installing to a hard disk which has been upgraded to a Dynamic Disk

You cannot re-install Windows 2000 and preserve a current hard disk partition which has been upgraded to a Dynamic Disk, using Express Setup.

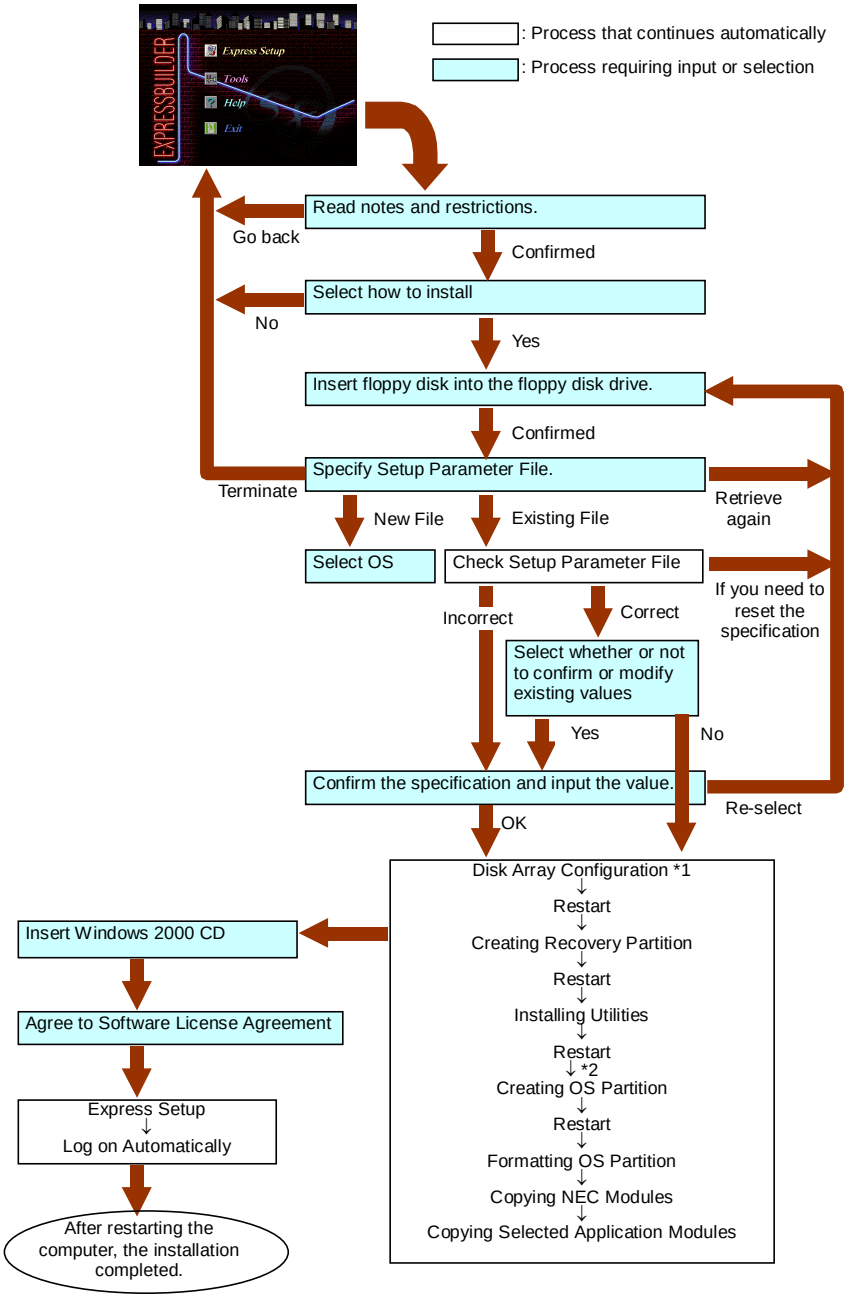
If you want to preserve the current partition, see Appendix D to re-install the system manually.

Disk Configuration (Concerning the area displayed as "MAINTE_P")

"Disk Management" under "Computer Management" may display a "MAINTE_P" partition. This area is a maintenance partition which contains configuration information and utilities. Do not delete this partition.

The Flow of Setup

This section visually describes the flow of the setup operated by Express Setup.



*1 Performed only when Disk Array Controller Board is installed and a RAID configuration is specified.
*2 If the operating system to be installed is [Others] or [NetWare], Express Setup is completed here.

Installing Windows 2000

This section describes how to install Windows 2000 using Express Setup.

Prepare the configuration diskette. You can perform the installation without a configuration diskette prepared in advance, but one floppy disk formatted by MS-DOS 1.44MB will be required. For the configuration diskette, use the blank disk included with EXPRESSBUILDER or prepare a floppy disk.

IMPORTANT:

- If you modified the system configuration, execute "System Update".
- If you want to modify or add a graphic accelerator driver or network adapter driver, see Appendix D.

1. Power up peripheral devices, and then power up the server.
2. Insert the EXPRESSBUILDER CD into the CD-ROM drive.
3. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to boot the EXPRESSBUILDER CD. (You may also power down, then power up, to reboot the server.)

   The system boots from the CD and EXPRESSBUILDER starts.
4. The "Language Selection Menu" is displayed. Select the language and keyboard to be used to perform Express Setup.
5. Click [Express Setup].

   "Note" will be displayed.
6. Read the instruction carefully and click [OK].

   The message "Insert configuration diskette" appears.
7. Insert the configuration diskette into floppy disk drive and click [OK].

NOTE: If you do not have a configuration diskette, insert a blank 1.44MB formatted floppy disk into the floppy disk drive and click [OK].

[Using the configuration diskette]

The Setup Files contained on "configuration diskette" will be displayed.

1) Select the Setup File name to use during the installation.

NOTE: If there is any problem that can not be corrected in the Setup File you selected, the message to select another "configuration diskette" appears. In this case, select another setup file or create a new setup file.

After the Setup File is specified, the message "Do you want to review or modify the Setup File parameters?" is displayed.

2) If you want to review or edit the information file, click [Yes]. If you do not want to review or edit the information file, and want to continue the installation, click [Skip].

If [Yes] → Go to step 8.

If [Skip] → Go to step 9.

[Using Blank disk]

3) Click the box under [Setup File Name: (A)] or press **A**.

The input box appears.

4) Input the file name.

[Operating System to Install] appears.

The OS supported by the computer is displayed in the list.

5) Select [Windows 2000] from the list box.

8. Confirm the contents specified during OS installation.

Under "Language Information" specify the language version of the operating system to be installed and the keyboard to be used on the installed system.

If a Disk Array Controller Board is installed in the Express server, the [Configure RAID] screen appears. Confirm the RAID configuration, modify if necessary, and then click [Next].

Next, [Basic Information] screen appears. Confirm the existing values, modify as required, and then click [Next]. ("Supported Computer" shown in the screen differs according to the model.)

After, click [Next], [Back], or [Help] on the screen to continue. Modify the existing values as required.

IMPORTANT:

- Modify the partition size as required to install the operating system on a partition larger than the minimum required size.
- If you select "Use Existing Partition" at "System Partition", the data files contained in the first partition (excluding recovery partition) will be deleted and reformatted. The data files contained in the other partition will be retained.

  Example:

First Partition <Maintenance Partition> Retained	Second Partition Deleted	Third Partition Retained	Forth Partition Retained

- You can not re-install the system and preserve an existing partition that has been upgraded to a Dynamic Disk using Express Setup.
- If "Create New Partition" is selected at "System Partition", do not specify a value for the partition larger than the available disk area.
- If you specify a partition size larger than 2000MB, you must specify "convert to NTFS".
- If "Use Existing Partition" at "System Partition" is selected but the partition selected to install Windows 2000 is the only partition, except for maintenance, Express Setup will reserve the maximum area of the hard disk to install Windows 2000.
- You can not go to the next screen if an incorrect value is specified.
- If a specified value is inconsistent with values previously specified, it may be necessary to go back to modify previously specified values.
- During the Windows 2000 setup, a screen appears to specify the partition that Windows 2000 is to be installed on. The first 16MB area displayed on the screen is a maintenance partition that is used to store the configuration information or utilities unique to the server. This partition must not be deleted. If you do not want to reserve this 16MB area, you must perform the installation by manual setup. Express Setup requires the use of this maintenance partition.

NOTES:

- If you click [Cancel] in [Basic Information] screen, the Express Setup will go back to allow you to reselect the Setup File. [Cancel] exists only in [Basic Information] screen. You can use [Back] in the subsequent screen to return to the [Basic Information] screen.
- If you click [OK] rather than [Next] in [Role of Computer] screen, setup will automatically select default values for the later screens and continue the installation.

When you complete the setting of setup parameter values, the system will reboot.

9. When prompted remove the EXPRESSBUILDER CD and the configuration diskette, and insert the Windows 2000 CD into CD-ROM drive.

The [Software License Agreement] screen appears.

10. Read the contents carefully and click [I agree.] or press **F8** if you do agree. If you do not agree, click [I disagree] or press **F3**.

IMPORTANT:

- If you do not agree to this agreement, the setup terminates and Windows 2000 will not be installed.
- If "NetWare Gateway (and Client) Service" is to be installed, a window to specify the details of "NetWare Gateway (and Client) Service" will be displayed at first login.

11. If you selected [Apply] on [Apply Service Pack] at Basic Information, follow the procedure below.

1) When prompted take the Windows 2000 CD out of CD-ROM drive, then click [OK].

2) When prompted insert the Windows 2000 Service Pack 5 or later into the CD-ROM drive, then click [OK].

Windows 2000 and any specified applications will be installed automatically and the local administrator will be automatically logged on to the system. Express Setup has now completed. Install and configure the device drivers, as described in the following section.

Installing and Configuring Device Drivers

Follow these steps to install and configure the device drivers.

Network Driver

Specify the details of network driver.

The standard network drivers will be installed automatically, but the link speed and Duplex mode need to be specified manually.

For each network controller:

1. Click Start menu and click [Network and Dial-Up Connection].

   The [Network and Dial-Up Connection] dialog box appears.

2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

   The [Local Area Connection Properties] dialog box appears.

3. Click [Configure].

   The property dialog box for network adapter appears.

4. Click [Advanced] and specify the same [Link Speed & Duplex] value as specified for HUB.

5. Click [OK] on the property dialog box for network adapter.

6. Click [OK] on the [Local Area Connection Properties] dialog box.

Also, add or delete protocols and services as required. Perform these actions from the property dialog box of the local area connection under [Network and Dial-up Connection].

> **NOTE:** We recommend that you add [Network Monitor] under [Adding Services]. [Network Monitor] can monitor frames (or packets) that this computer sends or receives. It is a valuable tool when analyzing network trouble. For information on how to install the [Network Monitor], see the "Setup for Problem Resolution" later in this document.

Install PROSet II

PROSet II is a utility that enhances the functionality of the network driver. Utilizing PROSet II enables the following:

- Provides detailed adapter information.
- Provides diagnostic capabilities: loop back test, packet transmission test and so on.
- Provides support for adapter teaming.

Configuring several network adapters as a single team provides the server an environment that is tolerant of adapter failures and enhances throughput across the teamed adapters.

Follow the procedure below to install PROSet II.

1. Insert the EXPRESSBUILDER CD into the CD-ROM drive.
2. When the EXPRESSBUILDER window appears, click "Driver & Utilities" on the "EB ToolBar".
3. Select Intel, click on "PROSet II for Windows 2000" under Intel Advanced Network Services.

   The [Intel (R) PROSet II Setup] dialog starts.
4. In the [Welcome] window, click [Next].

   If the dialog message "Digital Signature could not been found." appears, select [Yes].
5. Click [Finish].

   [Intel (R) PROSet II Setup] has completed.
6. Restart the system.

Graphic Accelerator Driver

Update the installed standard graphic accelerator driver.

If you want to utilize an optional Graphic Accelerator Driver board, follow the instructions provided with the board to install the driver.

1. Insert the EXPRESSBUILDER CD into the CD-ROM drive.
2. When the EXPRESSBUILDER windows opens, click "Drivers & Utilities" on the "EB Toolbar".
3. Select ATI. Click on "Rage XL Driver for Windows 2000."
4. Follow the displayed messages to continue the installation.

   If the dialog message "Digital Signature could not been found." appears, select [Yes] to continue.
5. Remove the EXPRESSBUILDER CD from the CD-ROM drive, follow the directions on the screen and restart the system.

Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)

Adapter Fault Tolerance (AFT) is a feature that creates a team containing more than one adapter and automatically directs network traffic to the adapters in the team when one of the adapters fails.

Adapter Load Balancing (ALB) is a feature that creates a team containing more than one adapter that enhances through put by balancing the load across the adapters, which are team members. This feature includes AFT feature.

IMPORTANT:

- AFT/ALB setup must be performed after installing the drivers and restarting the system.
- All the adapters specified as an Adapter Team must be on the same LAN. If they are connected to separate LANs, they cannot perform AFT or ALB.

If you want to utilize AFT/ALB feature, follow the procedure below to setup.

1. Double-click [Intel (R) PROSet II] on the [Control Panel] dialog box.

   The [Intel (R) PROSet II] dialog box appears.
2. Select "Intel 8255x-based PCI Ethernet Adapter (10/100)" in the list and right-click. Pull-down menu appears.
3. Select [Add to Team>] and then click [Create New Team...].

   The [Teaming Wizard] dialog box appears.
4. Select "Adapter Fault Tolerance" or "Adaptive Load Balancing" and click [Next].
5. Check the adapter to join the team and click [Next].
6. Click [Complete].
7. The setup will go back to [Intel (R) PROSet II] dialog box, so click [OK].
8. Restart the system.

Setup for Problem Resolution

Additional steps should be taken to facilitate the resolution of problems that might occur.

Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in the server.

> **IMPORTANT:** Memory Dump Information
>
> If any trouble occurs after initiating the process below, a message stating that the system is short of virtual memory may appear, but complete the process. If you restart the system the memory dump may not be stored correctly.

Follow the procedure below to specify.

1. Point to [Settings] in Start menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [System].

   The [System Properties] dialog box appears.

3. Click [Advanced].

4. Click [Startup and Recovery].

5. Enter the location to write the debug information in "Dump File" under "Write Debugging Information.".

   e.g. Write the debug information to D drive with the file name "MEMORY.DMP".

   D:\MEMORY.DMP

IMPORTANT:

- Specify "Kernel Memory Dump" under "Write debugging Information."
- Specify a drive where there is a free area greater than the size of "the memory installed on this Express server + 12MB".
- If the installed memory is increased, the size of the debug information (memory dump) to be collected must be increased. If the installed memory size is larger than 2GB, the maximum size of the dump file is 2048MB. The required amount of free space would be "2048MB+12MB".

6. Click [Performance Options].
7. Click [Change] on the [Virtual Memory] dialog box.
8. Modify [Initial Size] in the [Paging File Size for Selected Drive] box to a value larger than "[Recommended Size]", and click [Specify].

IMPORTANT:

- The above paging file size is necessary for collecting debug information (memory dump). If you set the initial value of paging file size smaller than the 'recommended' value, you may not be able to collect complete debug information (memory dump).
- For more information on "Recommended" value, see "Specifying Partition Size" described earlier.
- In anticipation of problems occurring it is recommended that a dump file always be prepared in advance.
- In case the memory is increased, re-specify the paging file size to suit the new memory size.

9. Click [OK].

   A message to restart the system may appear. If so, accept the prompt and restart the system.

Windows 2000 Dr. Watson

Windows 2000 Dr. Watson is a debugger for application errors. If any application error is detected,

Dr. Watson records the error and logs diagnostic information (log). Follow the procedure below and specify Dr. Watson to collect diagnostic information.

1. Click [Run] on Start menu.
2. Type "drwtsn32.exe" in the [Open] box, and click [OK].

   The [Dr. Watson for Windows 2000] dialog box appears.
3. Specify the location to store the diagnostic information in the [Log File Path] box.

   The diagnostic information will be stored with the file name "DRWTSN32.LOG".

   NOTE: You can not specify a network path. The file must be on the local computer.

4. Specify the location of crash dump file in the [Crash Dump] box.

   NOTE: "Crash Dump File" is a binary file that can be read with Windows Debugger.

5. Check the following boxes on the [Option] box.

   ☑ Dump Symbol Table
   ☑Dump All Thread Contents
   ☑Add To Existing Log File
   ☑Create Crash Dump File

   For more information on each function above, refer to Online Help.
6. Click [OK].

Network Monitor

Network Monitor can help you to investigate and resolve network problems. To use Network Monitor, you need to restart the system after the installation has completed, therefore it is recommended you install Network Monitor before experiencing network problems.

1. Point to [Settings] from Start menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [Add/Remove Programs].

   The [Add/Remove Programs] dialog box appears.

3. Click [Add/Remove Windows Component].

   The [Windows Components Wizard] dialog box appears.

4. Check the [Management and Monitoring Tools] check box of the component ON and click [Next].

5. If the setup asks for a disk, insert Windows 2000 CD into CD-ROM drive and click [OK].

6. Click [Complete] in the [Windows Component Wizard] dialog box.

7. Click [Close] in the [Add/Remove Application] dialog box.

8. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [Network Monitor]. For information on how to operate Network Monitor, refer to Online Help.

Installing Maintenance Utilities

Various maintenance utilities are contained in your EXPRESSBUILDER CD. See EXPRESSBUILDER User's Guide on the EXPRESSBUILDER CD for installing the utilities on your server or management workstations.

Updating the System - Applying Service Pack -

Update the system if the following applies:

- CPU is expanded (expanded from single processor to a multi-processor).
- The system configuration was modified.
- The recovery process was used to recover the system.

Log on to the system with an account that has administrative authority (e.g. Administrator) and insert the EXPRESSBUILDER CD into the CD-ROM drive of the server.

The EXPRESSBUILDER screen appears, click "Drivers & Utilities" on the "EB Toolbar". Select "120Rd-2" and click "Windows 2000 NEC Update Module" and setup will start. After that, follow the prompts to continue the setup process and apply the Service Pack.

Making Backup Copies of System Information

The system information includes the current BIOS settings and other information specific to your server.

You should save this information after completing the system setup.

This backup data, will allow you to recover the information.

You can save the information using the following process.

1. Insert the EXPRESSBUILDER CD in the CD-ROM drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a floppy disk in the floppy disk drive.
6. Select [Save].

Microsoft Windows NT 4.0

This subsection provides information on installing Microsoft® Windows NT® 4.0 on your server. Read the instructions in this section before performing the installation.

> **NOTE:** To install Windows NT 4.0 without using Express Setup, see Appendix C.

Installation Notice

This section explains precautions and information you should be aware of before beginning installation in order to install Windows NT 4.0 correctly.

Supported OS on this model

The server supports the following Windows NT 4.0 versions:

- Microsoft Windows NT Server 4.0 (Described as "Windows NT 4.0" later on.)
- Microsoft Windows NT Server 4.0, Enterprise Edition (Described as "Windows NT 4.0 EE" later on.)

To install on Windows 2000, see the previous subsection. To install other OS, contact your sales dealer or maintenance service representative.

Windows NT 4.0 /Windows NT 4.0 EE

You can fully install Windows NT Server 4.0 (Windows NT 4.0) and Windows NT 4.0 Enterprise Edition (Windows NT 4.0 EE) using Express Setup. However, note the following issue:

IMPORTANT:

- Before starting the installation, complete the addition of optional boards and settings of required BIOS values.
- Use this user's guide when installing Windows NT 4.0 on this server system. Do not use the installation guide for installing Windows NT 4.0 that may be packaged with other software not supplied with the system.
- Service Pack
  Express Setup can apply "Service Pack 5" or later on the system. If you want to apply Service Pack older than Version 5, select [Do not Apply] in [Apply Service Pack] item when creating the Setup File to setup the system, and perform the "System Update" described later.
- After completing Express Setup, see "Setup for Problem Resolutions" described later to configure your system to facilitate problem resolution and recovery".
- If more than one network adapter is connected, specify the IP address for each adapter after starting OS

Disk Configuration

- Disk Administrator may display an area labeled "EISA Utility"

  This area is a maintenance partition which contains configuration information and utilities. Do not delete this area.

- Others
  - I If you want to install Windows NT 4.0 on a volume that has been mirrored using "Disk Management", you must invalidate the mirror before re-installing the system on a basic disk, and reconfigure the mirror after the installation has completed.
  - Management of a mirror volume can be performed from "Disk Management" under "Computer Management".

    NOTE: Management of a mirrored volume is performed from the [Fault Tolerance] menu of Disk Administrator.

  - If you want to create a Backup Domain Controller of Primary Domain Controller that has exceeded the router, do not use Express Setup and perform manual setup.

Specifying Partition Size

The minimally required size for the partition to install the system can be calculated from the following expression:

200MB + Paging File Size + Dump File Size

200MB	= The size necessary for installing the system
Paging File Size (Recommended)	= Mounted Memory Size + 12MB
Dump File Size	= Mounted Memory Size + 12MB

IMPORTANT: The above paging file size is the least required size for collecting debug information (memory dump).

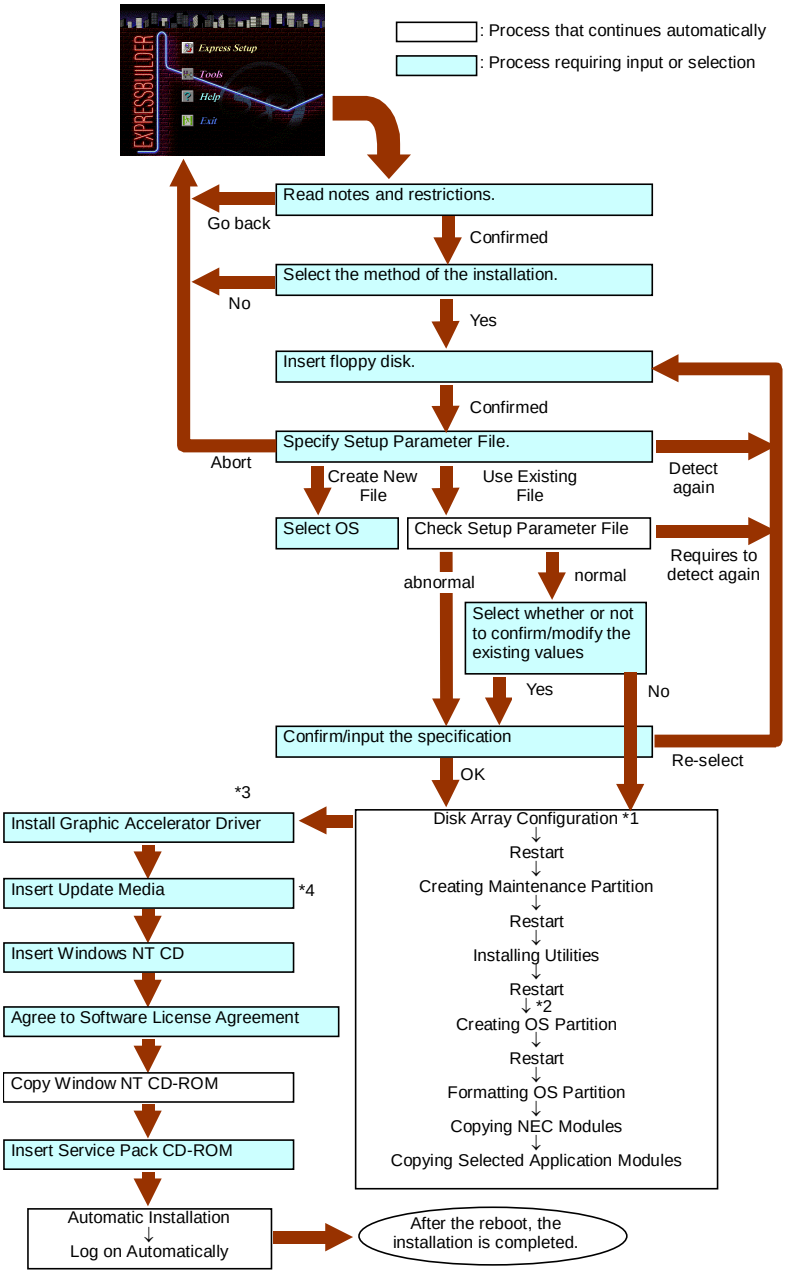
Specify the value larger than the "Recommended" value. If the default paging file size is specified smaller than the "Recommended" value, complete debug information (memory dump) may not be collected.

For example, if the mounted memory size is 512MB, the minimally required partition size can be calculated as follows:

200MB + (512MB + 12MB) + (512MB +12MB) = 1248MB

Flow of Setup

This section describes the flow of how to setup using Express Setup.



*1 This step occurs only when Disk Array Controller Board is connected and a RAID configuration is specified.
*2 If the operating system to be installed is [Others] or [NetWare], the process is completed here.
*3 This step occurs only when optional graphic accelerator board is connected.
*4 This step occurs only when you specify to apply update media during the installation.

Installing Windows NT 4.0

This section describes how to setup the system using Express Setup.

Prepare configuration diskette. You can perform the installation without a configuration diskette specified in advance, but one floppy disk formatted by MS-DOS 1.44MB will be required. For configuration diskette, use the blank disk in EXPRESSBUILDER package or prepare another floppy disk.

IMPORTANT: If you want to install Windows NT 4.0

- If you modified the system configuration, execute "System Update".
- Service Pack
  Express Setup can apply Service Pack 5 or later to the system. If you want to apply a Service Pack older than Version 5, select [Do not Apply] in the [Apply Service Pack] item when creating the Setup File to setup the system, and perform "System Update" described later.

1. Turn the power of peripheral devices on, and then turn on the server.
2. Insert EXPRESSBUILDER CD into the CD-ROM drive of the server.
3. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot the EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

   The system will boot from the CD-ROM and EXPRESSBUILDER starts.
4. The "Language Selection Menu" is displayed. Select the language and keyboard to be used to perform Express Setup.
5. Click [Express Setup].

   "Note" will be displayed.
6. Read the instruction carefully and click [OK].

   The message "Insert configuration diskette" appears.
7. Insert "configuration diskette" into floppy disk drive and click [OK].

NOTE: If you do not have a pre-specified configuration "configuration diskette", insert a blank 1.44MB formatted floppy disk into the floppy disk drive and click [OK].

[Using the specified configuration diskette]

The Setup Files contained on "configuration diskette" will be displayed.

1) Select the Setup File name to use during the installation.

NOTE: If there is any problem that can not be modified in the Setup File you selected, the message to set another "configuration diskette" appears. In such case, confirm the floppy disk you inserted.

After the Setup File is specified, the message "Do you want to review or modify the Setup File parameters?" is displayed.

2) If you want to review or edit the information file, click [Yes]. If you do not want to review or edit the information file but continue the installation, click [Skip].

If [Yes] → Go to step 8.

If [Skip] → Go to step 9.

[Using Blank disk]

1) Click the box under [Setup File Name: (A)] or press **A**.

The input box appears.

2) Input the file name.

[Operating System to Install] appears.

The OS supported by the computer is displayed in the list.

3) Select [NT 4.0] from the list box.

8. Confirm the contents specified during OS installation.

Under "Language Information" specify the language version of the operating system to be installed and the keyboard to be used on the installed system.

If a Disk Array Controller Board is installed in the Express server, the [Configure RAID] screen appears. Confirm the RAID configuration, modify if necessary, and then click [Next].

Next, [Basic Information] screen appears. Confirm the existing values, modify as required, and then click [Next]. ("Supported Computer" shown in the screen differs according to the model.)

After, click [Next], [Back], or [Help] on the screen to continue. Modify the existing values as required.

IMPORTANT:

- Modify the partition size to install the OS on a partition larger than the minimum required size.
- If you select "Use Existing Partition" at "System Partition", the data files contained in the first partition (excluding recovery partition) will be deleted and reformatted. The data files contained in the other partition will be retained.

First Partition <Maintenance Partition> Retained	Second Partition Deleted	Third Partition Retained	Forth Partition Retained

- You can not go to the next screen if an incorrect value is specified.
- If a specified value is inconsistent with values previously specified, it may be necessary to go back to modify them.
- If a partition larger than 4GB is specified, you must apply "Service Pack 5" or later. If so, you can not uninstall Service Pack 5 after starting Windows NT.

NOTES:

- If you click [Cancel] in [Basic Information] screen, the Express Setup will go back to allow you to reselect the Setup File. [Cancel] exists only in [Basic Information] screen.
- If you click [Complete] rather than [Next] in [Role of Computer] screen, setup will automatically select default values for the later screens and continue the installation.

When you complete the setting of setup parameter values, the system will reboot.

9. When prompted, remove the EXPRESSSBUILDER CD from the CD-ROM drive, and insert Windows NT CD into the CD-ROM drive.

   The [Software License Agreement] screen appears.

10. Read the contents carefully and click [I agree.] if you do agree. If you do not agree, click [I disagree.].

    IMPORTANT: If you do not agree to this agreement, the setup terminates and Windows NT 4.0 will not be installed.

11. When prompted, remove configuration diskette from the floppy disk drive, and Windows NT CD from the CD-ROM drive.

12. If you have specified to apply Service Pack 5 or later, insert the specified version of Service Pack into CD-ROM drive, when prompted.

    Windows NT 4.0 is installed automatically, and the local administrator is automatically logged on to the system.

    NOTE: If Backup Domain Controller was specified, the system does not logon the administrator automatically.

    Install and configure the device drivers as described in the following section.

Express Setup has completed.

Installing and Setting Device Drivers

Follow these steps to install and configure the device drivers.

Network Driver

Specify the details of network driver.

The standard network drivers will be installed automatically, but the link speed and Duplex mode need to be specified manually. For each network controller:

1. Select [Settings] from the Start pop-up menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [Network].

   The [Network] dialog box appears.

3. Click [Adapter], select network driver, and click [Properties].

   The [Intel(R) PROSet II] dialog box for network adapter appears.

4. Click [Advanced] and specify the same [Link Speed & Duplex] value as specified for HUB.

5. Click [OK] on the [Intel(R) PROSet II] dialog box for network adapter.

6. Click [OK] on the [Network] dialog box.

   Also, add or delete any protocols and services as required. You can perform these actions from the [Network] dialog box. Click [Protocol] to display the window to specify the protocols.

Graphic Accelerator Driver

IMPORTANT: Use Windows NT 4.0 Service Pack

1. Insert the EXPRESSBUILDER CD into CD-ROM drive.
2. When the EXPRESSBUILDER window opens, click on “Drivers & Utilities” in the EB toolbar.
3. Select ATI, then click on “Rage XL Driver for Windows NT.”
4. Follow the prompts and messages to complete the installation.

Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB) Setup

Adapter Fault Tolerance (AFT) is a feature that creates a team containing more than one adapter and automatically directs network traffic to the adapters in the team when one of the adapters fails.

Adapter Load Balancing (ALB) is a feature that creates a team containing more than one adapter that enhances through put by balancing the load across the adapters, which are team members. This feature includes AFT feature.

If you want to utilize AFT/ALB feature, follow the procedure below to setup.

IMPORTANT:

- To utilize AFT/ALB, you have to apply Service Pack 5 or later.
- AFT/ALB setup must be performed after installing the drivers and restarting the system.
- All the adapters specified as an Adapter Team must be on the same LAN. If they are connected to the separate LANs, they cannot perform AFT or ALB.

1. Double-click [Intel (R) PROSet II] on the [Control Panel] dialog box.

   The [Intel (R) PROSet II] dialog box appears.

2. Select "Intel 8255x-based PCI Ethernet Adapter (10/100)" in the list and right-click.

   Pull-down menu appears.

3. Select [Add to Team>] and then click [Create New Team...].

   If Service Pack 5 or later is not applied to the system, a window to notify you of that issue will be displayed at this point. In this case, click [OK] and go back to [Intel (R) PROSet II] dialog box, click [Cancel], apply Service Pack 5 or later and perform AFT/ALB setup again.

   IMPORTANT: If you utilize the AFT/ALB features with a system that has not had Service Pack 5 applied, the system may behave abnormally. Be sure to apply Service Pack 5 or later before utilizing the AFT/ALB features.

   [Teaming Wizard] dialog box appears.

4. Select [Adapter Fault Tolerance] or [Adaptive Load Balancing] and click [Next].
5. Check the adapter to join the team and click [Next].
6. Click [Complete].
7. The setup will go back to the [Intel (R) PROSet II] dialog box, so click [OK].

   According to the type of protocols and so on, input request for network information may occur at this point.

8. Click [Yes] on the [Reboot Required] dialog box and restart the system.

Setup for Problem Resolution

Additional steps should be taken to facilitate the resolution of problems that might occur.

Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in Express server.

IMPORTANT: Cautions for the Memory Dump

- The staff of maintenance service representative is in charge of collecting memory dump. Customers need only to specify the memory dump.
- If troubles occur after initiating the process below, a message stating that the system is short of virtual memory may appear, but complete the process. If you re-start the system in this case, memory the dump may not be stored correctly.

Follow the procedure below to specify.

1. Point to [Settings] in the Start pop-up menu and click [Control Panel].

   The [Control Panel] dialog box appears.
2. Double-click [System].

   The [System Properties] dialog box appears.
3. Click the [Startup/Shutdown].
4. Check [Write an event to the system log].
5. Check [Write debugging information to].
6. Enter the location to write the debug information to the text box.

   e. g. Write the debug information in D drive with the file name "MEMORY.DMP".

   D:\MEMORY.DMP

IMPORTANT:

- Specify the drive where there is a free area greater than the size of "the memory installed on the server + 12MB".
- If the installed memory is increased, the size of the debug information (memory dump) to be collected must be increased.

7. Click [Performance].
8. Click [Change].

   The [Virtual Memory] dialog box appears.
9. Modify [Initial Size] in the [Paging File Size for Selected Drive] box to a value larger than [Recommended Size], and click [Set].

   IMPORTANT:

   - Be sure to create the memory dump initial file with the size described above on the OS partition. If [Initial Size] of the paging file is specified to the value smaller than "Recommended" value, complete debug information (memory dump) may not be collected.
   - For more information on "Recommended" value, see "Specifying Partition Size" described earlier.
   - In anticipation of problems occurring, it is recommended that a dump file always be prepared in advance.
   - In case the memory is increased, change the paging file size to suit the new memory size.
10. Click [OK].

    A message to restart the system may appear. If so, accept the prompt and restart the system.

Dr. Watson

Windows NT Dr. Watson is a debugger for application errors. If any application error is detected, Dr. Watson diagnoses Express server and logs diagnostic information (log). Follow the procedure below and specify Dr. Watson to collect diagnostic information.

1. Click [Run] in the Start pop-up menu.
2. Type "drwtsn32.exe" in the [Name] box, and click [OK].

   The [Windows NT Dr. Watson] dialog box appears.
3. Specify the location to store the diagnostic information in the [Log File Path] box.

   The diagnostic information will be stored with the file name "DRWTSN32.LOG".

   IMPORTANT: You cannot specify a network path. The file must be on local computer.
4. Specify the location of crash dump file in [Crash Dump] box.

   NOTE: "Crash Dump File" is a binary file that can be read with Windows Debugger.
5. Check the following check boxes on the [Option] box.

   ☐ Dump Symbol Table

   ☐ Dump all thread contexts

   ☐ Append to existing file

   ☐ Create crash dump file

   For more information on each function above, refer to Online Help.
6. Click [OK].

Updating System Recovery Information

To prepare for a situation when the operating system has been destroyed, be sure to "Update Repair Information" as well as "Update the System" when you modified the system configuration so that the system can be recovered correctly in any case. System repair information includes configuration files and registry files.

NOTES:

- It is possible to save system repair information on a floppy disk, but the information may not fully be saved in one floppy disk when the registry has become large as a result of the installation of additional applications. In this case, the recovery disk will not be created correctly, but a message to inform you of that does not appear. On Windows NT, system repair can be performed by reading the repair information existing on the hard disk, so it is not necessary to create a repair floppy diskette.

IMPORTANT:

- "Update System Recovery Information" is intended to enable you to start the system when some problem has occurred on the system and the system will not start. "Update System Recovery Information" is not an operation to backup the system.
- If the system or its components have been modified during operation, follow the procedure below to perform "Update System Recovery Information".

1. Click [Run] in the Start pop-up menu.
2. Type "rdisk.exe" in "File Name" and click [OK].

   The [Repair Disk Utility] dialog box appears.
3. Click [Update Repair Info].
4. Click [Yes].

   The message "Do you want to create System Recovery Disk?" appears.
5. Click [No].
6. Click [Complete].

Network Monitor

Network Monitor helps you investigate and resolve network problems. To use Network Monitor, you need to restart the system after the installation has completed. It is recommended you install Network Monitor before experiencing network problems.

Installing Network Monitor during OS Installation

After the selection of network driver has completed, continue the installation until a window to add services is displayed.

1. Click [Select from the List].

   The list of [Network Service] appears.

2. Select [Network Monitor Tool and Agent] from the [Network Service] list and click [OK].

   Continue the OS installation.

Installing Network Monitor after OS Installation

1. Point to [Settings] from the Start pop-up menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [Network].

   The [Network] dialog box appears.

3. Click [Service] and click [Add].

   The [Select Network Service] dialog box appears.

4. Select [Network Monitor Tool and Agent] from the [Network Service] list and click [OK].

   The [Windows NT Setup] dialog box appears.

5. Insert Windows NT CD into CD-ROM drive and click [OK].

   If the drive letter of CD-ROM drive is not displayed correctly, modify it to the correct value.

   The setup goes back to the [Network] dialog box.

6. Close the dialog box and restart the system.

To start Network Monitor, point to [Program] → [Management Tool] and click [Network Monitor] from the Start pop-up menu. For information on how to operate Network Monitor, refer to Online Help.

Installing Maintenance Utilities

Various maintenance utilities are contained in your EXPRESSBUILDER CD-ROM. Refer to your EXPRESSBUILDER User's Guide for installing the utilities on your server or management workstations.

Updating the System - Applying Service Pack -

Update the system in the situation below:

- The system configuration was modified.
- The recovery process was used to recover the system.

In this case, follow the procedure below to update the system.

IMPORTANT:

- Be sure to use the Repair Disk Utility to update repair information when the system is updated or install a service pack.
- No Service Pack is included on EXPRESSBUILDER.

1. Log on to the system with the account that has administrative authority (e.g. Administrator).
2. Insert EXPRESSBUILDER CD into the CD-ROM drive of the server.
3. The EXPRESSBUILDER screen appears. Click on "Drivers & Utilities" on the EXPRESSBUILDER toolbar.
4. Select "120Rd-2." Click on "Windows NT4.0 NEC Update Module" and setup will start.
5. Select the Service Pack you want to apply.

   After that process, follow the message on the window to continue the setup.

Making Backup Copies of System Information

The system information includes the current BIOS settings and other information specific to your server.

You should save this information after completing the system setup.

This backup data allows you to recover the information.

You can save the information by the following process.

1. Insert the EXPRESSBUILDER CD into the CD-ROM drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a floppy disk in the floppy disk drive.
6. Select [Save].

Novell NetWare 5.0

This subsection contains instructions for installing and configuring the Novell NetWare v5.0 Network Operating System on your system.

For additional Novell NetWare information, it is important to read the NetWare "READ ME" files and related documentation provided by Novell.

> ***Note:*** Read the System Release Notes for the latest system information before attempting to install the Novell NetWare Network Operating System on your system.

Required Diskettes

The drivers required for the devices listed in the table below are located on the EXPRESSBUILDER CD. To create the required diskettes, perform "Custom Setup" on the EXPRESSBUILDER CD.

> **CAUTION**
>
> When creating the required diskettes from the EXPRESSBUILDER CD make sure you use the drivers required for the devices on your specific system.

Supported Device	Required Diskette*
AIC7899 Onboard Controller	NetWare OEM-Disk for 120Rd-2
NEC SecuRAID 112 (Mylex AcceleRAID 160)	
NEC SecuRAID 320 (Mylex AcceleRAID 352)	
Intel PRO/100+™ LAN Card	

*Generated from the NEC EXPRESSBUILDER CDROM

Installation Assumption

The installation and configuration instructions in this chapter assume the following:

- You will be installing (not updating) the Novell NetWare 5.0 Network Operating System from the CD-ROM media.

Preparation

The following sections describe the necessary preparation procedures for installing and configuring Novell NetWare v5.0.

Configuring RAID

If you have a disk array controller preinstalled on your system, it was preconfigured at the factory. Refer to your system's *User's Guide* and to the *RAID Installation Guide* and the *Disk Array Controller Installation Guide and User's Manual* for additional information on this option card. If you need to change the RAID level from the factory setting, you must change the setting before installing the operating system.

Configuration Checklist

Certain configuration information must be available before loading the Novell NetWare v5.0 Network Operating System. The following table is a checklist that helps you identify the information you need. You may need to ask your Network Administrator for some of the information.

Configuration Checklist

Step	Information	
1	**File Server Name.** Record the file server name for this system. File server name: _____	
2	**IPX Internal Network Number.** Record the IPX Internal Network Number for this system. (For more information about IPX Internal Network Numbers, see "IPX Internal Network Numbering" in the Novell *Concepts* manual.) IPX Internal network Number: _____	
3	**Country Code and corresponding Code Page**. Choose the Country Code and corresponding Code Page from the following selections. Circle one Country Code and one of the corresponding Code Pages.	
	Country Code	Code Page
	1. United States - 001	1. United States English - 437
	—	2. Multilingual - 850
	2. French Canada - 002	1. United States English - 437
	—	2. French Canadian - 863
	3. Latin America - 003	1. United States English - 437
	—	2. Multilingual - 850
	4. Netherlands - 031	1. United States English - 437
	—	2. Multilingual - 850
	5. Belgium - 032	1. United States English - 437
	—	2. Multilingual - 850
	6. France - 033	1. United States English - 437
	—	2. Multilingual - 850
	7. Spain - 034	1. United States English - 437
	—	2. Multilingual - 850

Configuration Checklist (Continued)

Step	Information	
3 (Cont.)	8. Italy - 039	1. United States English - 437
	—	2. Multilingual - 850
	9. Switzerland - 041	1. United States English - 437
	—	2. Multilingual - 850
	A. United Kingdom - 044	1. United States English - 437
	—	2. Multilingual - 850
	B. Denmark - 045	1. Multilingual - 850
	—	2. Nordic - 865
	C. Sweden - 046	1. United States English - 437
	—	2. Multilingual - 850
	D. Norway - 047	1. United States English - 437
	—	2. Nordic - 865
	E. Germany - 049	1. United States English - 437
	—	2. Multilingual - 850
	F. International English - 061	1. United States English - 437
	G. Portugal - 351	1. Multilingual - 850
	—	2. Portuguese - 860
	H. Finland - 358	1. United States English - 437
	—	2. Multilingual - 850

Configuration Checklist (Continued)

Step	Information
4	**Keyboard Mapping.** Choose your keyboard mapping from the following selections. (Circle one selection): 1. France 2. Germany 3. Italy 4. Spain 5. United States 6. None
5	**LAN Adapter.** Choose which type of LAN adapter is installed in the LAN adapter slot. Circle one selection. Intel PRO/100+ No adapter to configure
6	**IPX Network Number.** Record the IPX Network Number associated with the LAN adapter in slot one. (For more information about IPX Network Numbers, see "Network Numbering" in the Novell *Concepts* manual.) IPX Number: _____
7	Repeat steps 5 and 6 for each LAN adapter slot you are using.

Installing the Novell NetWare v5.0 Network Operating System

Note: Before you install the Novell NetWare Operating System, you should have your LAN adapter(s) connected to the LAN network(s). This allows the install process visibility to other servers and Directory Services already installed.

Note: A known problem for NetWare v5.0 always occurs during a new installation of the NetWare 5 Operating System on a computer with a processor speed of 450 MHz or higher. The server either hangs during "Scan for New Devices", or it displays the following error:

> Unable to Find File Z:\SYSTEM\TAR.NLM
> (Where Z: is the drive letter of the CDROM the server boots from.)

To correct this error you can interrupt the installation after the creation of the DOS partition and the initial file copy, then manually create a subdirectory (C:\NWUPDATE), copy the new drivers into that directory, and restart INSTALL.BAT from the NetWare 5 installation CDROM, maintaining the existing partitions.

1. Power on your server.
2. Insert the NetWare 5.0 CD into your CD-ROM drive.
3. Select a language for your locale and press ENTER.
4. Highlight “Accept License Agreement" from the menu and press ENTER.
5. Highlight “Create a New Boot Partition” from the menu and press ENTER.
6. At the boot partition screen, press ENTER to continue.
7. Highlight "Continue" from the "Are You Sure?" menu and press ENTER to create a new boot partition.
8. Press any key to reboot.
9. Highlight "Continue" to accept the default startup directory. Press ENTER.
10. Highlight "Continue" to accept the regional settings. Press ENTER
11. Highlight "Continue" to accept the mouse type and video mode. Press ENTER
12. From the Device Type menu Highlight "Modify". Press ENTER.
13. Highlight "Storage Adapters". Press ENTER.
14. Press INSERT.
15. Press INSERT.

16. Insert "NetWare 5.X OEM-Disk" diskette. Press ENTER.
17. Highlight and press ENTER for each driver listed below:

    MDAC.HAM (displayed only if a RAID board is installed)

    ADPT160M.HAM
18. Press ESC.
19. Highlight "Return to Drive Sumary". Press ENTER.
20. Press ESC.
21. Highlight "Continue". Press ENTER.
22. From the Device Driver menu Highlight "Modify". Press ENTER.
23. Highlight "Network Boards". Press ENTER.
24. Press "Insert" key.
25. Press "Insert" key.
26. Press ENTER.
27. Highlight "Return to Driver Summary". Press ENTER

> ***Note:*** Repeat steps 25 through 29 for additional Network Boards.

28. Press ESC and return to "Device Driver Summary".
29. Press ESC.
30. Highlight "Continue". Press ENTER.
31. Highlight "Continue" to create a NetWare partition and volume SYS. Press ENTER.
32. At the Server Properties box type in your server name and click "Next."
33. At the Protocols box, click the "Network Board" you want to configure.
34. Once you made your network board selection, specify the network protocol for each network board. Click "Next" to continue.

> ***Note:*** If you select IP, fill in the IP address, subnet mask and router information appropriately.

35. Select your correct time zone. Click "Next" to continue.
36. Select the NDS installation type for this server. Click "Next" to continue.

> ***Note:*** For this step we will select "Create a new NDS tree."

37. Enter your NDS and Administrator information and click "Next" to continue.

38. Insert your NetWare V5 license disk.

39. At the NDS Summary screen, click "Next" to continue.

40. Select "Additional Products and Services" desired and click "Next" to continue.

41. Click "Finish" at the summary screen.

42. Remove any diskettes and/or CDs and click "Yes" to restart your server.

43. Install the appropriate support pack.

Restarting the Server

You should now “restart” the server to initialize your changes.

You can do this by typing the following commands from the **Server_name:** prompt:

restart server

Backing Up the Server

You should now use Novell's Backup Utility or some other backup facility to backup your server.

Novell NetWare 5.0X

This chapter contains supplemental instructions needed to install and configure hardware and software used with the Santa Cruz Operation (SCO) Network Operating System OpenServer Release 5.0X. This information is intended to supplement the more detailed procedural documents available from Santa Cruz Operation. This information is not intended to be the central source of installation and configuration information for SCO UNIX® on your system.

> ***Note:*** Read the System Release Notes for the latest system information before attempting to install SCO UNIX on your system.

Required Diskettes

> ***Note:*** Diskettes for the PCI LAN cards and RAID adapter card are generated from the EXPRESSBUILDER CD shipped with the system.

Depending upon the hardware complement in your system, you may require some or all of the diskettes listed in the table below. They should be generated before attempting to install the operating system. Also listed in the table below are the required diskette labels.

> **⚠ CAUTION**
>
> When creating the required diskettes from the EXPRESSBUILDER CD make sure you use the drivers required for the devices on your specific system.
>
> Always read the information in the release notes or inserts, included with any options for they supersede the information in this guide.

Device	Required Diskette[1]
NEC SecuRAID 112 (Mylex AcceleRAID 160)	Mylex AcceleRAID 160/352 for SCO OpenServer Driver [2]
NEC SecuRAID 320 (Mylex AcceleRAID 352)	
Adaptec 7899 Onboard Controller	Ultra 160 Driver for SCO OpenServer 5.0X
Intel PRO/100+™ LAN Card	Intel PRO/100+ Driver for SCO OpenServer 5.0X

[1] Generated from the EXPRESSBUILDER CD.
[2] Required only if RAID controller card is installed.

Preparation

The following sections describe the necessary preparation procedures for installing SCO UNIX 5.0X.

⚠ CAUTION

DOS Partitions: MS-DOS allows installation of multiple primary DOS partitions. However, SCO Open Systems Software allows only one primary DOS partition and one extended DOS partition on the boot drive. If you install more than one primary and one extended DOS partition, SCO Open Systems Software will be unable to access *any* DOS partition.

Checking System Configuration

Before installing SCO, make sure that your system configuration is correct. Run the BIOS Setup Utility to check system configuration. Refer to the *Configuring Your System* chapter of your User's Guide for more information on how to run these utilities.

Configuration Checklist

Configuration Checklist

Step	Information
1	**File Server Name.** Record the file server name for this system. File server name: _____
2	**IP Address.** Assign an IP address for each LAN card that is to be installed into the system. Seven maximum. IP Address Number: _____ IP Address Number: _____ IP Address Number: _____ IP Address Number: _____ IP Address Number: _____
3	**License Number.** Record the license number for the SCO OpenServer operating system. License number: _____
4	**License Code.** Record the license code for the SCO OpenServer operating system. License code: _____

Configuring RAID

If you have a disk array controller preinstalled on your system, it was preconfigured at the factory. Refer to your system's *User's Guide* and to the *RAID Installation Guide* and the *Disk Array Controller Installation Guide and User's Manual* for additional information on this option card. If you need to change the RAID level from the factory setting, you must change the setting before installing the operating system.

Installing Optional Hardware

This section contains supplemental hardware installation and configuration information.

Installing Optional Adapters

If you are installing optional adapters, refer to the installation guide that came with the adapter, the SCO documentation and the System User's Guide shipped with your system for installation and configuration information.

The following optional adapter may be added to your system.

Disk Array Controller - Refer to your system's *User's Guide* and to the RAID Installation Guide and the *Disk Array Controller Installation Guide and User's Manual* for additional information on this option card.

Installing Other Hardware

Refer to the *Upgrading Your System* chapter of your System User's Guide for installing additional memory, additional hard disk drives or new peripheral devices.

Where to Go From Here

Now that all your system hardware options are installed, you are ready to install SCO. Go to the *Installing and Configuring System Software* section to perform this task.

Installing and Configuring System Software

This section contains supplemental information for installing and configuring SCO UNIX® OpenServer Release 5.0X Operating System.

Installing SCO OpenServer Rel. 5.0X Software without a Disk Array Controller Installed

> ***Note:*** This section assumes that you have properly completed the hardware installation. If you have not done so, please refer to the corresponding documentation and complete the hardware installation before trying to proceed with driver installation.

> ***Note:*** Read the *Release Notes* (packaged with your operating system documentation) before starting the installation.

SCO installation instructions in the *SCO UNIX OpenServer Rel. 5.0X Handbook* provide more extensive installation procedures. Chapter 2 of the *SCO OpenServer Rel. 5.0X Handbook Installation Guide* includes an installation checklist to assist you in installing or upgrading to SCO UNIX OpenServer 5.0X.

Once the installation is complete, including all additional options, such as Symmetrical Multiprocessing (if required), the SCO Maintenance Supplement 505A should be added. Installation of SCO Maint 505A involves using the software manager and a set of four diskettes generated from the EXPRESSBUILDER CD.

1. Insert the SCO OpenServer™ Version 5.0X CD into the CD-ROM drive and boot your system. You will see the following message:

   SCO OpenServer™ Release 5.0X

   Boot:

   Type: *defbootstr link= ad160* *Std=ad160 (0, 0, 0, 0)*

   Press ENTER.

2. The installation continues until the system displays this message:

   Please insert the fd(65) ad160 volume and press <Return> or 'q' to quit.

3. Insert the Adaptec Driver diskette (made from the EXPRESSBUILDER CD) into the floppy drive and press ENTER.

4. The system continues until the system displays this message:

   Please enter “r’ if you wish to try replacement.

   Type *r* and press ENTER.

5. The system displays standard SCO OpenServer Rel. 5.0X copyright messages such as

   Restricted Rights Legend. Use duplication, or disclosure.

   Press ENTER to continue.

   Press ENTER to accept.

6. The system displays the message:

   Identifying the installation media device. Make sure the IDE indicates CD-ROM secondary and master.

   Press ENTER.

7. The system displays the message:

   Keyboard

   Press ENTER.

8. The system displays the message:

   Enter License Number and License Code.

   Press ENTER.

9. The system displays the message:

   Additional License Software — Continue

10. The system displays the message:

    “Suitable for Automatic Upgrade”

    Enter appropriate Upgrade or Fresh

    Press Enter

11. Select OK

12. The system displays the message:

    “Configure the Basic System”

    Enter appropriate choices.

13. The system displays the message:

    “Initial System Profile”

    Enter appropriate choices.

14. The system displays the message:

    “Preparing Your Disk”

    Enter appropriate choices.

15. The system displays the message:

    "Configuring Optional Software"

    Enter appropriate choices (You may want to select a mouse).

16. The system displays the message:

    "Password"

    Enter appropriate choices.

17. The system displays the message:

    "The Installation can now proceed unattended"

    Select OK and Press ENTER.

18. Somewhere toward the end of the installation, the following messages are displayed:

    Configuring the kernel driver installation…
    Press ENTER to continue:
    Press ENTER to continue.

19. When the system has completed its installation, you will see the following message:

    Installation and initial configuration of SCO OpenServer Rel. 5.0X Enterprise System is complete…

    Press ENTER to continue:

    Press ENTER to continue. The system displays:

    **** Safe to Power Off ****

    - or -

    **** Press any Key to Reboot ****

20. If a SCSI tape drive is attached to channel B of the 7899, perform the following steps. This will generate a new idscsi file to correct a kernel/link problem. Otherwise, go to step 24.

21. Start the newly installed system.

22. Insert the 7899 driver disk, which has an additional file that must replace an existing file in the operating system.

23. Log into "Root" and from the "Unix" window issue the following:

    "mount -f/dev/fd0/mnt."

    "cp/mnt/idscsi/etc/conf/bin"

24. This concludes the installation of SCO 5.0X UNIX. You need to open the diskette drive and reboot the SCO 5.0X UNIX operating system from the system drive you just installed.

This concludes the installation of SCO 5.0X UNIX. You need to open the diskette drive and reboot the SCO 5.0X UNIX operating system from the system drive you just installed.

Note: During the installation of SCO or any time thereafter when booting SCO a warning message may appear as follows:

WARNING: Cannot connect to APM, error 0x0036 System loaded, press <Return> to start:

To prevent the WARNING message from appearing, boot the system to single-user Mode. Edit the /etc/default/boot file. Add "apm.check=no" to the end of the line indicated by the "DEFBOOTSTR=" entry.

It is recommended that any additional software packages be installed at this time. After all additional software is installed; it is recommended that Maintenance Supplement 505A be installed on your system.

Installing SCO OpenServer Rel. 5.0X Software with a RAID Controller Installed

> ***Note:*** This section assumes that you have properly completed the hardware installation and the drive array configuration. If you have not done so, please refer to the corresponding documentation and complete the hardware installation and configuration before trying to proceed with driver installation.

Installation of SCO OpenServer Version 5.0X involves installation of a disk array driver for your disk array system. The procedure basically follows the standard SCO UNIX installation with some variations. During the installation, when prompted, insert the SCO UNIX driver diskette for the Disk Array Controller into the floppy disk drive.

> ***Note:*** Before installing SCO UNIX, ensure that system drive 0 (boot drive) has been configured for write-through cache. If write-back cache has been configured, the SCO UNIX root file system may be corrupted at the completion of the installation. After the installation is completed, the system drive can be toggled to write-back cache.

1. Insert the SCO OpenServer™ Version 5.0X CD into the CD-ROM drive and boot your system. You will see the following message:

   SCO OpenServer™ Release 5.0X

   Boot:

   Type: *defbootstr link= "mdac"*
   Sdsk=mdac(0,0,0,1)

   Press ENTER.

2. The system displays this message:

   Please insert the fd(60) mdac volume and press ENTER or press Q to quit.

   Insert the Mylex RAID Driver diskette (made from the EXPRESSBUILDER CD) into the floppy drive and press ENTER.

3. The system continues with this message:

   Please enter "r' if you wish to try replacement.

   Type *r* and press ENTER.

4. The system continues with these messages:

   mdac: Driver "mdac" successfully loaded.

   Character major = 19

5. The system displays the message:

   Please insert (mdac) package BLTD disk into the floppy drive so that it can be extracted onto the hard disk for incorporation into the link-kit.

   Insert diskette and press ENTER

6. The system displays standard SCO OpenServer Rel. 5.0X copyright messages such as

   Restricted Rights Legend. Use duplication, or disclosure.

   Press ENTER to continue.

   Press ENTER to accept.

7. The system displays the message:

   Identifying the installation media device. Make sure the IDE indicates CD-ROM secondary and master.

   Press ENTER.

8. The system displays the message:

   Keyboard

   Press ENTER.

9. The system displays the message:

   Enter License Number and License Code.

   Press ENTER.

10. The system displays the message:

    Additional License Software — Continue

11. The system displays the message:

    “Suitable for Automatic Upgrade”

    Enter appropriate Upgrade or Fresh

    Press Enter

12. Select OK

13. The system displays the message:

    “Configure the Basic System”

    Enter appropriate choices.

14. The system displays the message:

    “Initial System Profile”

Enter appropriate choices.

15. The system displays the message:

    "Preparing Your Disk"

    Enter appropriate choices.

16. The system displays the message:

    "Configuring Optional Software"

    Enter appropriate choices (You may want to select a mouse).

17. The system displays the message:

    "Password"

    Enter appropriate choices.

18. The system displays the message:

    "The Installation can now proceed unattended"

    Select OK and Press ENTER.

19. Somewhere toward the end of the installation, the following messages are displayed:

    Configuring the kernel driver installation…
    Press ENTER to continue:

    Press ENTER to continue.

20. When the system has completed its installation, you will see the following message:

    Installation and initial configuration of SCO OpenServer Rel. 5.0X Enterprise System is complete…

    Press ENTER to continue:

    Press ENTER to continue. The system displays:

    **** Safe to Power Off ****

    - or -

    **** Press any Key to Reboot ****

21. If a SCSI tape drive is attached to channel B of the 7899, perform the following steps. This will generate a new idscsi file to correct a kernel/link problem. Otherwise, go to step 25.

22. Start the newly installed system.

23. Insert the 7899 driver disk, which has an additional file that must replace an existing file in the operating system.

24. Log into "Root" and from the "Unix" window issue the following:

"mount -f/dev/fd0/mnt."

"cp/mnt/idscsi/etc/conf/bin"

This concludes the installation of SCO 5.0X UNIX. You need to open the diskette drive and reboot the SCO 5.0X UNIX operating system from the system drive you just installed.

> ***Note:*** During the installation of SCO or any time thereafter when booting SCO a warning message may appear as follows:
>
> WARNING: Cannot connect to APM, error 0x0036 System loaded, press <Return> to start:
>
> To prevent the WARNING message from appearing, boot the system to single-user Mode. Edit the /etc/default/boot file. Add "apm.check=no" to the end of the line indicated by the "DEFBOOTSTR=" entry.

It is recommended that any additional software packages be installed at this time. After all additional software is installed; it is recommended that Maintenance Supplement 505A be installed on your system.

> ***Note:*** Do not change the system drive 0 (boot drive) cache policy to write-back until after the installation completes.

Installation of Tape Drives

After the installation of SCO 5.0X UNIX is complete, ensure the tape device is configured to the proper controller. If reconfiguring is necessary, follow the instructions in the hardware section of the SCO OpenServer Rel. 5.0X Handbook.

Installation of CD-ROM Drives

Ensure that the CD-ROM device is connected to the proper controller. If reconfiguring is necessary, follow the instructions in the hardware section of the SCO OpenServer Rel. 5.0X Handbook.

Adding System Drives

After installing SCO UNIX on system drive 0 (root drive), it may be necessary to create additional file systems on any other system drives. Use the command "mkdev hd" to partition and create file systems on additional system drives.

Installing the Intel PRO/100+ LAN Card Driver from a Diskette

The driver for the Intel PRO/100+ LAN card is generated from the EXPRESS BUILDER CD.

To load an Intel PRO/100+ LAN card driver, insert the Intel PRO/100+ Driver diskette into your disk drive and logon to the SCO Open Server graphical interface. Use the following procedure to install the driver.

1. Select the *Software Manager* icon from the Main Menu display.
2. Within the menu bar click on *Software.* A pull-down menu displays.
3. Select *Install New*. A dialog box displays asking if you are installing the driver from the host system or another host.
4. Highlight the host system in which the driver media is installed and press ENTER (click on Continue).
5. A dialog box displays asking for the media device used for this installation. Select the media device (usually the floppy diskette drive) and press ENTER (click on Continue).
6. A dialog box displays the driver(s) read from the media. Select the appropriate driver and press ENTER (click on Full).
7. A dialog box appears. Please use *netconfig* to configure network software, press return to continue. Press ENTER.
8. A message dialog box displays indicating *"Installation complete."* Press **ENTER** or select *OK*.
9. The Software Manager displays the loaded driver.
   Select *Exit* from the *Host* pull down menu.

Configuring the Intel PRO/100+ LAN Card

1. Select the *System Administration* icon from the Main Menu display.
2. Select the *Networks* icon.
3. Select the Network Configuration Manager.
4. Select the *Hardware Options* pull-down menu and choose *Add New LAN Adapter.*
5. Highlight the card to be installed.
6. Select *Continue.*
7. When the *Add Protocol* menu is displayed select *SCO TCP/IP*, then select *ADD.*
8. Enter the required information to configure TCP/IP, then select *OK*. Refer to the *SCO OpenServer Handbook, Appendix A, TCP/IP Configuration Parameters*.

> **Note:** When configuring multiple sub-networks on the same system, the system names for each sub-network must be unique.

9. At the "Product successfully completed" message, select *OK*.
10. After the configuration is complete and the current networking configuration is displayed, select *Hardware* from the menu bar, and then select *Exit*.
11. At the message the "UNIX kernel must be relinked...", select *YES* to relink the kernel.
12. At the message "Do you want this kernel to reboot by default", enter YES and press ENTER.
13. At the message "Do you want the kernel environment rebuilt", enter YES and press ENTER.
14. Press ENTER to continue.
15. Reboot your system.

Configuring Additional Hard Disks

Configuring additional hard disk drives requires that they be hardware configured and low-level formatted (most disks are shipped already low-level formatted).

For SCO UNIX Open System and OpenServer Rel. 5.X Software to recognize more than one hard disk drive, you must execute a series of commands. For a detailed description of the commands, refer to the chapter entitled "Adding Hard Disks and CD-ROM Drivers" in the *SCO UNIX Operating System Administrator's Guide* or the *SCO Open Systems Rel. 5X Hardware Configuration Guide.*

An example of the command sequence is shown below:

SCSI Disks
mkdev hd
(build a kernel)
(reboot the system)
mkdev hd
mkdev fs
mountall

Refer to the on-line SCO *man* page for information on the *mkdev* (ADM) command.

Chapter 5

Maintenance

This chapter describes the daily maintenance of the server and precautions you should take when relocating or storing the server.

MAKING BACKUP COPIES

It is important to make backup copies of your valuable data stored on hard disks of the server on a regular basis. For backup storage devices suitable for the server and backup tools, consult with your sales agent.

When you have changed the hardware configuration or BIOS configuration, select "System Information Management" and then "Save" of the Off-line Maintenance Utility to make a backup copy of the system information.

Also make a backup copy of the disk array configuration data if your system includes a disk array controller. When your hard disks have been auto-rebuilt due to a failure, it is recommended you make a backup copy of the configuration data. To make a backup copy of the configuration data, use the configuration utility that is resident in the FLASH memory on the optional disk array controller board. Refer to the manual supplied with the board.

CLEANING

Clean the server on a regular basis.

⚠ WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury.

Do not disassemble, repair, or alter the server.
Do not look into the CD-ROM drive when it is powered up.
Do not remove the lithium battery.
Disconnect the power plug before cleaning the server.

⚠ CAUTION



Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage

Avoid running the server at high temperature because of removed covers or insufficient air cooling in the area where the server is installed.

Cleaning the Server

For daily cleaning, wipe the external surfaces of the server with a dry soft cloth. Follow the procedure below if stains remain on the surfaces:

IMPORTANT:

- To avoid altering the material and color of the server, do not use volatile solvents such as thinner and benzene to clean the server.
- The power receptacle, the cables, the connectors on the rear panel of server, and the inside of the server must be kept dry. Do not moisten them with water.

1. Make sure that the server is off-powered (the POWER/SLEEP lamp goes off).
2. Unplug the power cord of the server from a power outlet.
3. Wipe off dust from the power cord plug with a dry cloth.
4. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
5. Rub off stains on the server with the cloth prepared in Step 4.
6. Soak a soft cloth in water, squeeze it firmly, and wipe the server with it once again.
7. Wipe the server with a dry cloth.
8. Wipe off dust from the fan exhaust opening on the rear of the server with a dry cloth.

Cleaning the Interior

One of the most important items in a good maintenance program is regular and thorough cleaning of the interior of the server, especially around the system board.

Dust buildup inside the server can lead to several problems. As dust acts as a thermal insulator, a buildup can prevent proper system cooling. Excessive heat will shorten the life of server components. Also, dust may contain conductive or corrosive materials that can cause short circuits or corrosion of electrical contacts.

How often you should clean the interior of the server depends on the environment in which it is located. For most office environments, you probably should clean the server every 12 months. For more severe environments, clean the interior every 6 months.

Cleaning the interior of the server entails powering off the server and removing the left side cover. You will need a small vacuum cleaner (with plastic tipped nozzle and electrostatic protection), computer grade canned air, and a small brush for cleaning the interior.

Follow the procedure below to clean the interior of the server.

⚠ WARNING



Unplug all power cords.

Unplug all power cords before performing any maintenance. Voltage is present inside the server and display unit even after the power is turned off. All voltage is removed only when the power cord is unplugged.

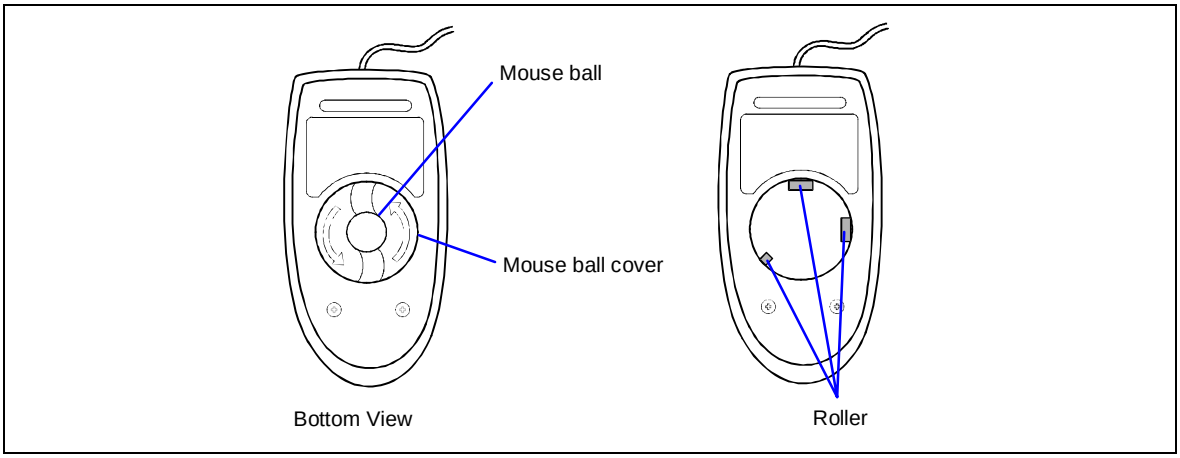
1. Turn off the server and unplug all power cables.
2. Remove the top cover. (See Chapter 7.)
3. Use a small brush to loosen any dust and debris on the system board.
4. Use computer grade canned air to blow dust off components on the system board.
5. Use a small vacuum cleaner with plastic tip to vacuum out dust and debris from the interior of the server.
6. Reinstall the top cover. (See Chapter 7.)
7. Reconnect all power cables and turn on the server.

Cleaning the Keyboard/Mouse

Make sure that the server and peripheral devices are all off-powered (the POWER lamp goes off), and then wipe the keyboard surface with a dry cloth.

The mouse operation depends on the degree of smoothness of the internal ball rotation. To keep the mouse ball clean, use the mouse in a place with little dust. Follow the steps below to clean the mouse regularly:

1. Prepare cold or lukewarm water, neutral detergent, alcohol, two dry soft clothes, and cotton swabs.
2. Make sure that the server is off-powered (the POWER/SLEEP lamp goes off).
3. Turn the mouse upside down, and rotate the mouse ball cover counterclockwise to remove it.
4. Take out the ball from the mouse. Cover the bottom of the mouse with your hand, and turn your hand holding the mouse (the mouse is on your palm with the button upward). The mouse ball is released onto your palm.



5. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
6. Rub off stains on the mouse ball. Softly wipe the mouse ball with the cloth prepared in Step 5.
7. Wipe the mouse ball with a dry soft cloth.
8. Wipe three small rollers inside the mouse with a cotton swab soaked with alcohol. Wipe stains slowly and carefully by rotating rollers with the tip of the cotton swab.
9. Blow out any dust from the mouse. Protect your eyes from the dust.
10. Put the mouse ball back into the mouse.
11. Place the mouse ball cover, and rotate it clockwise until it is locked.

Cleaning CD-ROM

A dusty CD-ROM or dust-accumulated tray causes the device to fail to read data correctly.

Follow the procedure below to clean the tray and CD-ROM regularly:

1. Make sure that the server is powered (the POWER/SLEEP lamp is lit).
2. Press the Eject button on the front of the CD-ROM drive.
   The tray comes out.
3. Hold the CD-ROM lightly and take it out from the tray.

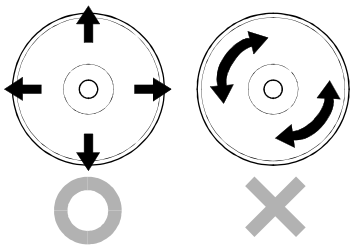
   NOTE: Do not touch the signal side of the CD-ROM with your hand.

4. Wipe the tray with a dry soft cloth.

   IMPORTANT: Do not wipe the lens of the CD-ROM drive. Doing so may damage the lens and may cause a malfunction of the drive.

5. Press the Eject button or gently push on the tray front to close the tray.
6. Wipe the signal side of the CD-ROM with a dry soft cloth.

   IMPORTANT: Wipe CD-ROMs from the center to the outside. Use only CD-ROM cleaner if necessary. Cleaning a CD-ROM with record spray/cleaner, benzene, or thinner causes damage to the CD-ROM contents. At worst, inserting the CD-ROM into the server may cause failure.



SYSTEM DIAGNOSTICS

The System Diagnostics runs several tests on the server.

Use the System Diagnostics program in the EXPRESSBUILDER provided with the server to diagnose the server.

Test Items

The following items are tested in system diagnostics.

- Memory
- CPU cache memory
- Hard disk used as a system
- On-board LAN controller

IMPORTANT: When executing the system diagnosis, make sure to remove the LAN cable. Executing the system diagnosis with the LAN cable connected, the network may be influenced.

NOTE: On checking the hard disk, no data is written into the disk.

Starting and Ending the System Diagnostics

There are two ways to diagnose the server: to use the local console (keyboard) of the server itself, and to use the management PC via serial port (remote console).

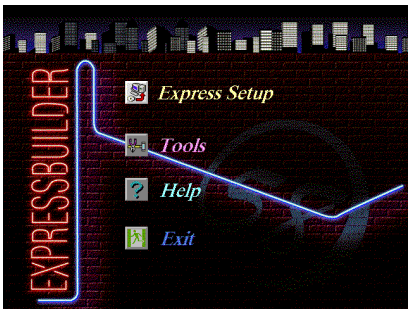
Procedures to start the diagnostic program is as follows:

> **IMPORTANT:** Both LAN and COM port can be used in remote console mode, however, in system diagnostics, only the COM port can be used.

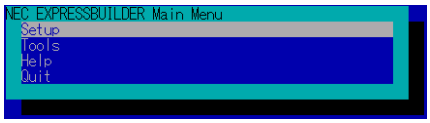
1. Shutdown the OS, and turn off the server. Then, unplug the power cord.
2. Disconnect all the LAN cables from the server.
3. Plug the power cord and turn on the server.
4. Use EXPRESSBUILDER CD-ROM to reboot the server.

   See the EXPRESSBUILDER User's Guide, located on the EXPRESSBUILDER CDROM, for details.

   The following menu appears when started the server using EXPRESSBUILDER.



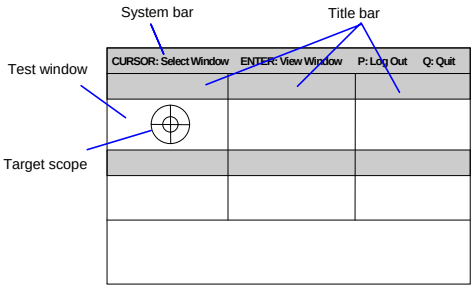
Local console



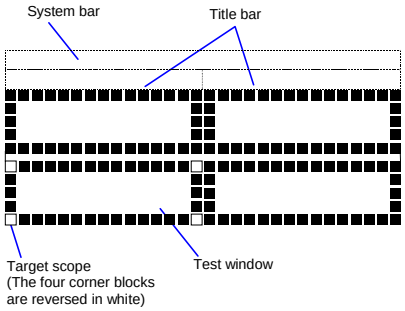
Remote console

5. Select [Tools].
6. Select [System Diagnostics].

   The system diagnostics starts and completes in approximately three minutes.
   When the diagnosis completes, the following appears on the screen of the display unit.



Screen showing diagnostic result
(Local console)



Screen showing diagnostic result
(Remote console)

System bar: Shows information including time of progress during the diagnosis and descriptions on key operations to navigate the window upon completion of the diagnosis.

Title bar: Shows the diagnostic items. If an error is detected, the bar is indicated in red (local console), or flashing (remote console).

Test window: Shows the progress or result of diagnosis.

Target scope: Cursor to select the test window. Use the cursor keys on the keyboard to move it to another test window. (Move the target scope to a desired window and press **Enter**. Now you can view detailed information on the selected window. To return to the previous window, press **Enter** once again.)

IMPORTANT: To select the test window in remote console, press keys as shown below.

PageUp: **Ctrl** + **A**, PageDown: **Ctrl** + **Z**

If an error is detected during the system diagnosis, an error information is displayed as follows. Take a note on the error message and contact your sales agent.

Local console: The title bar turns in red, and error information is displayed in red characters.

Remote console: The test item indicated on the title bar flashes.

7. Press **Q** and select "Reboot" from the menu.

   The server restarts and the system is launched from EXPRESSBUILDER.

8. Exit the EXPRESSBUILDER, and remove the CD-ROM from the CD-ROM drive.
9. Turn off the server and unplug the power cord from the receptacle.
10. Reconnect all the LAN cables to the server.
11. Plug the power cord.

This completes the system diagnosis.

RELOCATING/STORING THE SERVER

Follow the procedure below to relocate or store the server:

⚠ CAUTION



Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage

Never attempt to lift the server by yourself. Two people are required to safely lift the server.
Do not install the server in any place other than specified.
Do not connect/disconnect any interface cable with the power cord of the server plugged to a power source.

IMPORTANT:

- If the server needs to be relocated/stored due to a change in the floor layout to a great extent, contact the sales agent.
- Make sure to make a backup copy of your valuable data in the hard disk, if any.
- Make sure not to apply a shock to hard disks to relocated the server if the contains any.

1. Take a floppy disk and a CD-ROM out of the server, if any.
2. Power off the server (the POWER lamp goes off).
3. Disengage the power cord from the tie wrap.
4. Unplug the power cord of the server from a power outlet.
5. Remove all the cables from the server.
6. Remove the server from the rack cabinet.

   See Chapter 3 for details.
7. Hold the server by its bottom with at least another person to carry the server.
8. Protect the server with the shock-absorbing materials, and pack it securely.

Chapter 6

Troubleshooting

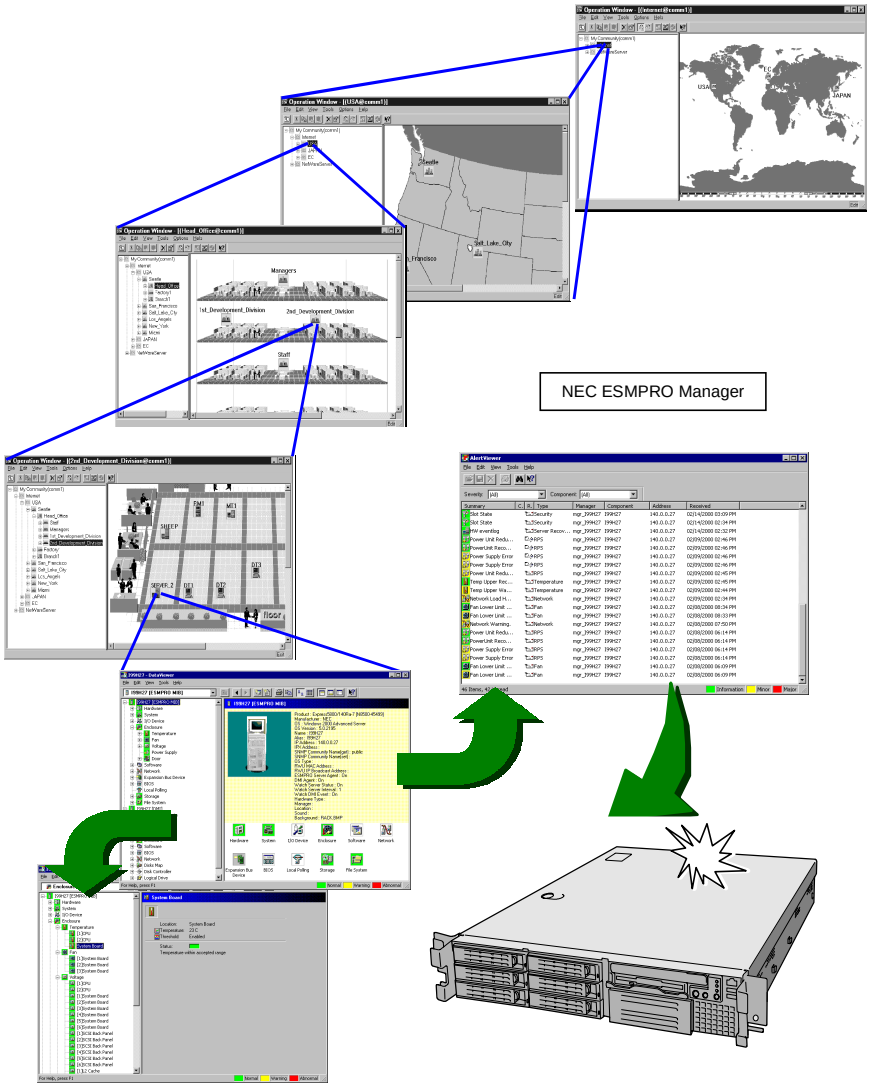
This chapter provides information for troubleshooting problems with your server.

> **NOTE:** To best determine the source of problems with your server, it is recommended that you install ESMPRO on the server and client computers.

SYSTEM VIEWERS

ESMPRO system viewers let you monitor fault parameters and system alerts during system operation. ESMPRO viewers include the Joint Viewer, Data Viewer, and Alert Viewer

[Example]



LEDS

The server includes several LEDs, located on the front panel, hard disk drive, and power supply indicate server states by a variety of colors and display patterns.

Chapter 1 "Status Indicators" lists LED displays and their meanings and the actions that should be taken at occurrences of specific LED displays.

ERROR MESSAGES

If an error occurs in the server, an error message appears on the display unit connected to the server or a beep code corresponding to the error may be heard. Beep codes are discussed later in this chapter.

Error Messages after Power-on

Powering on the server automatically starts the self-diagnostic program, POST (Power On Self-Test). When POST detects any error, it displays an error message on the display unit.

Use the table below to troubleshoot POST errors.

Use of the keyboard or mouse at the following times may cause POST to assume a keyboard controller error has occurred and stop processing.

- Immediately after the server is powered up
- Immediately after the system is rebooted (**Ctrl** + **Alt** + **Delete**)
- Immediately after the system is rebooted in response to an OS instruction
- During hardware initialization following restart of the POST

When POST detects a hardware failure due to any of the above conditions, reboot the server. If the same error message occurs, you may assume there is not a hardware error. To ensure normal operation of the server, however, make sure to follow the following restrictions.

- Do not make any keyboard entry or use the mouse before the memory count appears on the screen following the server power-on.
- Do not make any keyboard entry or use the mouse before the start-up message of the SCSI Configuration Utility appears on the screen following the server reboot.

IMPORTANT: If you suspect an error, note all on-screen messages before contacting your sales agent.

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen. The following table lists error messages, descriptions, and actions to take.

> **IMPORTANT:** Note on the messages displayed before consulting with your sales agent.

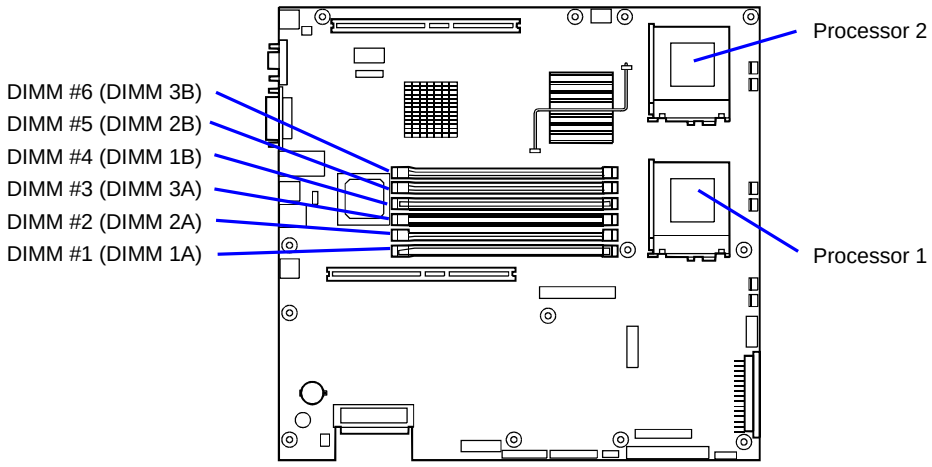
On-screen error message		Description	Action
100	Timer Channel 2 Error	Timer channel 2 error	Contact your sales representative to replace the system board.
101	Master Interrupt Controller	IDE master interrupt error	
102	Slave Interrupt Controller	IDE slave interrupt error	
103	CMOS Battery Failure	System RAM error due to a battery failure. Offset address	
104	CMOS Option not Set	System CMOS setting error	Contact your sales representative to replace the system board. (Restart the computer, and then execute SETUP to correct the setting.)
105	CMOS Checksum Failure	System CMOS checksum error	Execute SETUP to correct the setting.
106	CMOS Display Error	Display error	Contact your sales representative to replace the system board.
107	Insert Key Pressed	**Insert** is pressed.	Release the key. Reconnect the keyboard.
108	Keyboard Locked Message	The keyboard is locked.	
109	Keyboard Stuck Key	A key is held down.	Release the key. Contact your sales representative to replace the system board.
10A	Keyboard Interface Error	Keyboard interface error	Reconnect the keyboard. Contact your sales representative to replace the system board.
10B	System Memory Size Error	System memory error	Install the DIMMs correctly. Check if all the installed DIMMs are under the same specification. Contact your sales representative to replace the DIMMs.
10E	External Cache Failure	External cache error	Install the CPU (processor) correctly. Contact your sales representative to replace the CPU.
110	Floppy Controller Error	Floppy disk controller error	Contact your sales representative to replace the floppy disk drive or system board. This server does not support floppy disk drive B.
111	Floppy A: Error	Floppy disk drive A error	
112	Floppy B: Error	Floppy disk drive B error	

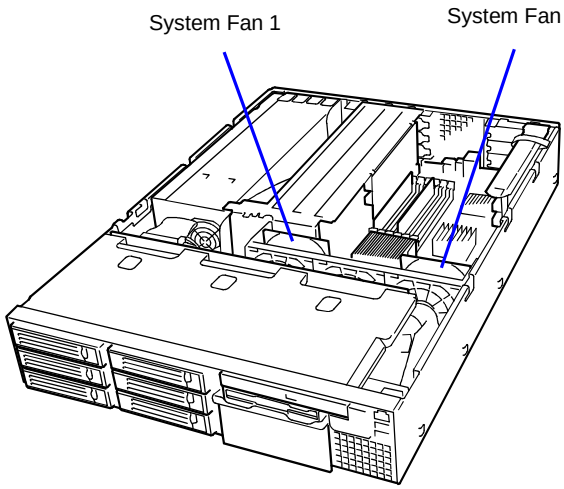
On-screen error message		Description	Action
113	Hard disk 0 Error	Hard disk error	Contact your sales representative to replace the system board, SCSI back-plane, or hard disk.
114	Hard disk 1 Error		
115	Hard disk 2 Error	Hard disk error	Contact your sales representative to replace the system board, SCSI back-plane, or hard disk.
116	Hard disk 3 Error		
117	CD-ROM disk 0 Error	CD-ROM disk error	Contact your sales representative to replace the system board or the CD-ROM drive.
118	CD-ROM disk 1 Error		
119	CD-ROM disk 2 Error		
11A	CD-ROM disk 3 Error		
11B	Date/Time not set	The date and time are not set.	Activate the BIOS SETUP utility to set the date and time.
11E	Cache memory bad	Cache memory error	Install the CPU (processor) correctly. Contact your sales representative to replace the CPU.
120	CMOS clear	The CMOS contents were cleared.	Activate the BIOS SETUP utility to set the CMOS or password. Contact your sales representative to replace the system board.
121	Password clear	The password was cleared.	
140	PCI Error	PCI board error	Securely install the PCI boards and PCI riser card. Contact your sales representative to replace the PCI board, system board, or PCI riser card.
141	PCI Memory Allocation Error	PCI board memory allocation error	
142	PCI IO Allocation Error	PCI board I/O allocation error	
143	PCI IRQ Allocation Error	PCI board interrupt error	Activate the BIOS SETUP utility to set the PCI board. Securely install the PCI boards and PCI riser card. Contact your sales representative to replace the PCI board, system board, or PCI riser card.
144	Shadow of PCI ROM Failed	PCI board shadow ROM error	
145	PCI ROM not found	The expanded ROM on the PCI board cannot be detected.	Securely install the PCI boards and PCI riser card. Contact your sales representative to replace the PCI board, system board, or PCI riser card.
146	Insufficient Memory to Shadow PCI ROM	The area for extending the expanded ROM on the PCI board is insufficient.	For PCI boards which do not need to be bootable, activate the BIOS SETUP utility to disable extension of the expanded ROM on the PCI board. Securely install the PCI boards and PCI riser card. Contact your sales representative to replace the PCI board, system board, or PCI riser card.

On-screen error message		Description	Action
8100	Processor 1 failed BIST	Burst transfer error of processor 1	Securely install the processor. Contact your sales representative to replace the processor or system board.
8101	Processor 2 failed BIST	Burst transfer error of processor 2	
8110	Processor 1 Internal error (IERR)	Internal error (IERR) of processor 1	
8111	Processor 2 Internal error (IERR)	Internal error (IERR) of processor 2	
8120	Processor 1 Thermal Trip error	Thermal trip error of processor 1	
8121	Processor 2 Thermal Trip error	Thermal trip error of processor 2	
8130	Processor 1 disabled	The processor [1, 2] was disabled due to an error.	Securely install the processor. Contact your sales representative to replace the processor or system board.
8131	Processor 2 disabled		
8140	Processor 1 failed FRB-3 timer	The processor could not be initialized at booting, and a timeout occurred.	
8141	Processor 2 failed FRB-3 timer		
8150	Processor 1 failed initialization on last boot	Processor 1 could not be initialized at the previous booting.	Securely install the processor. If the message is displayed each time the system is booted, contact your sales representative to replace the processor or system board.
8151	Processor 2 failed initialization on last boot	Processor 2 could not be initialized at the previous booting.	
8160	Processor 01: unable to apply BIOS update	The internal control code of the processor [1, 2] could not be applied.	Contact your sales representative to replace the processor or system board.
8161	Processor 02: unable to apply BIOS update		
8170	Processor P1 :L2 cache failed	The second cache in the processor [1, 2] could not be initialized.	
8171	Processor P2 :L2 cache failed		
8180	BIOS does not support current stepping for Processor P1	A processor of an unsupported type is installed.	
8181	BIOS does not support current stepping for Processor P2		
8190	Watchdog Timer failed on last boot	A watchdog timer error occurred at the previous booting.	Securely install the processor. If the message is displayed each time the system is booted, contact your sales representative to replace the processor or system board.
8191	4:1 Core to bus ratio: Processor Cache disabled	The cache of the processor was disabled.	
8192	L2 Cache size mismatch	The second cache in the processor does not match.	Install processors under the same specification.
8193	CPUID, Processor Stepping are different	The CPU ID or stepping does not match the value in the installed processor [1, 2].	

On-screen error message		Description	Action
8194	CPUID, Processor Family are different	The processor type does not match the value in the installed processor [1, 2].	
8195	Front Side Bus Speed mismatch. System Halted	The front side bus speed does not match the value in the installed processor [1, 2].	Securely install the processor. Contact your sales representative to replace the processor or system board.
8196	Processor Model are different	The processor model does not match the value in the installed processor [1, 2].	Install processors under the same specification.
8197	CPU Speed mismatch	The processor clock speed does not match the value in the installed processor [1, 2].	
8300	Baseboard Management Controller failed to Function	The baseboard management controller does not function.	Contact your sales representative to replace the system board.
8301	Front Panel Controller failed to Function	The front panel controller does not function.	
8305	Hotswap Controller failed to Function	The hot swap controller installed on the SCSI back-plane (HSBP) does not function.	
8420	Intelligent System Monitoring Chassis Opened	The top cover is not installed correctly.	Install the top cover correctly.
84F1	Intelligent System Monitoring Forced Shutdown	The system was forcibly shut down.	Confirm that the system starts normally. If the system is in abnormal state, contact your sales representative to replace the system board.
84F2	Server Management Interface Failed	A server management interface failure occurred.	Contact your sales representative to replace the system board.
84F3	BMC in Update Mode	The baseboard management controller is in update mode.	Ask your sales representative for maintenance.
84F4	Sensor Data Record Empty	There is no sensor data record.	
84FF	System Event Log Full	The event log is full.	Clear the event log by using the BIOS SETUP utility. If the error is not eliminated, contact your sales representative to replace the system board. The error message is displayed periodically if ESMPRO is not installed. The event log must be cleared periodically.

The following figures show the location of specific components referenced in the POST Error Codes and Messages table.





NOTE: Failed CPU or memory boards can be also identified with the SETUP utility.

Beep Codes

If an error occurs during the POST, the server beeps, indicating the type of error.

Each number indicates the number of short beeps, and a hyphen indicates a pause. For example, the beep interval 1-5-2-2 indicates 1 beep, pause, 2 beeps, pause, 2 beeps, pause, and 3 beeps notifying that no processor is detected on the system board.

Beeps	Error	Recommended Action
1	Refresh timer error	Contact your sales representative to replace the system board
2	Parity error	Check if the DIMM cards are mounted correctly. If the error still occurs when the check result is normal, contact your sales representative to replace the DIMM card or system board.
3	Base memory failure	
4	System timer error	Contact your sales representative to replace the system board.
5	Processor failure	Contact your sales representative to replace the processor or system board.
6	Keyboard controller error	Check if the keyboard is connected correctly. Contact your sales representative to replace the keyboard or system board.
7	Processor exception interrupt error	Contact your sales representative to replace the processor or system board.
8	Display memory read/write error	Contact your sales representative to replace the system board.
9	ROM checksum error	Contact your sales representative to replace the system board.
10	Shutdown register error	
11	BIOS disabled	
1-5-1-1	FRB failure	Contact your sales representative to replace the processor or system board.
1-5-2-1	Processor type error	Check if the type of the mounted processor is correct. If the error still occurs when the check result is normal, contact your sales representative to replace the processor or system board.
1-5-2-2	Processor not detected	Check if the processor is mounted correctly. If the error still occurs when the check result is normal, contact your sales representative to replace the processor or system board.
1-5-4-2	Power failure	Contact your sales representative to replace the power supply unit, power jumper board, or system board.
1-5-4-3	Chip set control error	Contact your sales representative to replace the system board.
1-5-4-4	Power control error	Contact your sales representative to replace the power supply unit, power jumper board, or system board.

SOLVING PROBLEMS

When the server fails to operate as expected, see the following to locate your problem and follow the instruction given to solve the problem.

If the server still fails to operate after attempting to solve a problem, note on-screen messages or beep codes and contact your sales agent.

Problems with the Server

No screen display appears with beep:

→ Note the beep code pattern, and take appropriate action according to the Beep Code table described earlier in this chapter.

Fail to power on the server:

θ Is the server properly supplied with power?

→ Check if the power cord is connected to a power outlet (or UPS) that meets the power specifications for the server.

→ Make sure to use the power cord provided with the server. Check the power cord for broken shield or bent plugs.

→ Make sure the power breaker for the connected power outlet is on.

→ If the power cord is plugged to into a UPS, make sure the UPS is powered on. See the manual that comes with the UPS for details.

The power supply in the server may be linked with the connected UPS using the BIOS setup utility of the server.

<Menu to check: [Server] - [After Power Failure]>

θ Did you press the POWER switch?

→ Press the POWER switch on the front of the server to turn of the power (the POWER lamp lights).

Fail to power off the server:

- θ Is the POWER switch enabled?

  → Restart the server and start the BIOS setup utility.

  <Menu to check: [Security] - [Power Switch Inhibit]>

- θ Is the server running in the Secure Mode?

  → The POWER switch is disabled in the Secure Mode. (Forced shutdown is also not available.) To release the Secure Mode, enter the password specified with the BIOS setup utility.

POST fails to complete:

- θ Are the DIMMs installed?

  → At least two DIMMs are required for operation.

- θ Is the memory size large?

  → The memory check may take a few seconds if the memory size is large.

- θ Did you perform any keyboard or mouse operation immediately after you started the server?

  → If you perform any keyboard or mouse operation immediately after start-up, POST may accidentally detect a keyboard controller error and stops proceeding. In such a case, restart the server once again. Do not perform any keyboard or mouse operation until the BIOS start-up message appears when you restart the server.

- θ Does the server contain authorized memory boards or PCI devices?

  → Operation of the server with unauthorized components could cause system errors.

Fail to access internal or external devices (or such devices fail to operate):

- θ Are cables properly connected?

  → Make sure that the interface cables and power cords are properly connected. Also make sure that the cables are connected correctly.

- θ Is the power-on order correct?

  → When the server has any external devices connected, power on the external devices first, then the server.

- θ Did you install drivers for connected optional devices?

  → Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver.

- θ Is the BIOS configuration correct?

  → When the server has PCI devices connected, make sure to set the PCI device interrupt and other settings with the BIOS setup utility of the server. (Most PCI devices generally do not require any change to the configuration, but some boards do require specific settings. Refer to the manual that comes with the board for details to make correct settings.

  <Menus to check: [Advanced] - [PCI Configuration] - [PCI Slot xx ROM]
  x: PCI slot number>

  → Some devices connected to the serial or parallel port may require I/O port address or operation mode settings. Refer to the manual that comes with the board for details to make correct settings.

  <Menu to check: [Advanced] - [Peripheral Configuration]>

The DUMP and SLEEP switches are disabled:

- θ Is the server in the Secure Mode?

  → In the Secure Mode, the DUMP switch is disabled. To release the Secure Mode, enter the password specified with the BIOS setup utility.

The keyboard or mouse fails to operate:

- θ Is the cable properly connected?

  → You must use the provided keyboard/mouse branch cable (Y cable) for this server. Make sure that the provided cable is connected to the correct connector on the rear of the server.

  → The keyboard or mouse does not operate if it is connected when the server is powered on (not applicable to USB devices). Power off the server first and then connect the keyboard or mouse.

- θ Is BIOS configuration correct?

  → The keyboard and mouse may be disabled with the BIOS setup utility of the server. Check the settings with the BIOS setup utility.

  <Menus to check: [Advanced] - [Numlock]>

- θ Are server drivers installed?

  → Refer to the manual that comes with your operating system (OS) to check that the keyboard and mouse drivers are installed. (These drivers are installed along with the OS.) Some OS's allow you to change the keyboard and mouse settings. Refer to manual that comes with your OS to check that the keyboard and mouse settings are correct.

- θ Is the server in the Secure Mode?

  → In the Secure Mode, the keyboard and mouse are disabled. To release the Secure Mode, enter the password specified with the BIOS setup utility.

The following message appears on system log of event viewer while installing Windows 2000:

```
An error was detected on device \Device\CdRom0 in paging operation.
```

→ There is no problem when this message occurs.

Fail to access (read or write) to the floppy disk:

- θ Does the floppy disk drive contain a floppy disk?

  → Insert a floppy disk into the floppy disk drive until it clicks.

- θ Is the floppy disk write-protected?

  → Place the write-protect switch on the floppy disk to the "Write-enabled" position.

- θ Is the floppy disk formatted?

  → Use a formatted floppy disk or format the floppy disk in the floppy disk drive. Refer to the manual that comes with the OS for formatting a floppy disk.

- θ Is BIOS configuration correct?

  → The floppy disk drive may be disabled with the BIOS setup utility of the server. Check the setting with the BIOS setup utility.

  <Menus to check:
  [Main] - [Floppy A]
  [Advanced] - [Peripheral] - [Diskette Write Protect]
  [Advanced] - [Peripheral] - [Diskette Controller]>

- θ Is the server in the Secure Mode?

  → In the Secure Mode, write access to the floppy disk may be disabled. To release the Secure Mode, enter the password specified with the BIOS setup utility.

Fail to access to the CD-ROM:

- θ Is the CD-ROM properly installed in the CD-ROM drive tray?

  → A tray is provided with a holder to secure the CD-ROM. Make sure that the CD-ROM is placed properly in the holder.

- θ Is the CD-ROM applicable to the server?

  → The CD-ROM for Macintosh should not be used in this server.

Inserted the correct CD-ROM, but the message like the following is displayed:

```
The CD-ROM is not inserted or the wrong CD-ROM is inserted.
Please insert the correct CD-ROM.
OK
```

- θ Is the data side of the CD-ROM dirty or scratched?

  → Take the CD-ROM out of the CD-ROM drive, confirm that it is not dirty or scratched, reset and click [OK].

Fail to access the hard disk:

(Refer to the documentation supplied with the disk array controller.)

- θ Is the hard disk applicable to the server?
- θ Is the hard disk properly installed?

  → Make sure to lock the hard disk with the lever on its handle. The hard disk is not connected to the internal connector when it is not completely installed (see Chapter 7).

Fail to access the (internal or external) SCSI devices:

- θ Is the SCSI device applicable to the server?
- θ Are SCSI devices properly configured?

  → When the server has external SCSI devices connected, hard disk settings, including SCSI ID and terminator, are required. Refer to the manual that comes with the SCSI device for details.
- θ Are the SCSI controllers (including optional controllers) properly configured?

  → Use the BIOS setup utility for proper configuration of SCSI devices connected to the SCSI connector on the system board. When the server has an optional SCSI controller installed and SCSI devices connected to it, use the BIOS setup utility that comes with the optional SCSI controller for proper configuration. See the manual that comes with the optional SCSI controller for details.

Cannot install the operating system correctly.

- θ Did you read the notes on installing the operating system?

  → See Chapter 4. You should always use EXPRESSBUILDER when installing an operating system on this server.

During Windows 2000 installation, the following warning is registered in the System Log of the Event Viewer:

```
Error detected on the device \Device\CdRom0 during the paging
operation.
```

→ There is no problem when this message occurs.

Fail to start the OS:

- θ Is a floppy disk in the floppy disk drive?

  → Take out the floppy disk and restart the server.

- θ Is the EXPRESSBUILDER CD in the CD-ROM drive?

  → Remove the EXPRESSBUILDER CD and restart the server.

- θ Is the OS corrupted?

  → Use recovery process to recover the operating system. (See "Recovery for Windows 2000/Windows NT System" in this chapter.)

The event log after every logon to Windows 2000 includes the following error log:

Description (D) The CPUs in this multiprocessor system are not all the same revision level. To use all processors the operating system restricts itself to the features of the least capable processor in the system. Should problems occur with this system, contact the CPU manufacture to see if this mix of processors is supported.

- θ Has a second CPU been added to your server?

  → If a different revision (stepping) of a processor is installed in a multiprocessor system, Windows 2000 logs the above information at every startup. If this message is displayed, it is not a problem.

The OS is unstable<Windows 2000/Windows NT>:

- θ Did you update the system?

  → Installing a network drive after installation of the OS may cause unstable operation. Use the EXPRESSBUILDER CD-ROM to update the system. (See Chapter 4.)

When a trouble occurs, the system does not "Restart automatically" <Windows 2000>:

→ When a trouble occurs while running Windows 2000, the system may not restart automatically even if "Restart automatically" is specified. In this case, restart the system manually.

Cannot turn the power OFF at a blue screen error<Windows 2000>:

→ If you want to turn off the power at the blue screen error, execute forced power off (forced shut down: press the POWER switch for at least 4 seconds). The power will not be turned off if you do not hold the POWER switch in for at least 4 seconds.

An error log is included in the event log after log-on <Windows NT 4.0>:

Description (D) Crash dump is not available for use. Windows NT could not initialize the page file for the boot partition in response to the crash dump request. The system may have physical memory of 3.8 GB or more.

θ Has additional memory been installed?

→ When you install additional memory, you will need to increase the paging file size.

Change the paging file size appropriate to the installed memory.

Add 12MB to the real memory and specify the value for the paging file size.

Double-click on [System] in the Control Panel and click on [Performance]. Click on [Change] for [Virtual Memory].

Change the initialization and maximum sizes and click on [Change].

Restart the system.

NOTE: See Chapter 4 for changing the paging file size on a Windows 2000 system.

Unstable operation <NetWare>:

→ When the system errors occur, refer to the NetWare operating system documentation to check the configuration for any errors.

Novell Inc. regularly releases updates that include patches for solving OS problems. Before placing the system in service, consult with your NetWare dealer for the latest patches and updates.

If the OS configuration is correct and up-to-date, but an error continues to occur, contact your sales agent.

The server is not found on the network:

θ Is the LAN cable connected?

→ Make sure the LAN cable is connected to the network port on the rear of the server. Also make sure that the LAN cable conforms to tour particular network interface standards.

θ Is the BIOS configuration correct?

→ The internal LAN controller may be disabled with the BIOS setup utility of the server. Check the setting with the BIOS setup utility.

<Menus to check:

[Advanced] - [PCI Configuration] - [Onboard NIC 1], [Onboard NIC 2]>

θ Have the protocol and service been configured?

→ Install the correct network driver for the server. Make sure that the protocol, such as TCP/IP, and services are properly specified.

θ Is the transfer speed correct?

→ The internal LAN controller installed in the server in the standard configuration supports the transfer speed of 100 Mbps and 10 Mbps. This transfer speed may be selected or changed by the OS. However, do not specify "Auto Sense". Specify a specific speed, "100" or "10".

θ Have you updated the system? <Windows NT>

→ If the network driver is installed after the OS installation has completed, you must reboot the system after installation of a network driver.

Problems with EXPRESSBUILDER

When booting from the EXPRESSBUILDER CD fails, check the following:

- θ Did you insert the EXPRESSBUILDER CD during POST and restart the server?

  → If you do not insert the EXPRESSBUILDER CD during POST and restart the server, an error message will appear or the OS will boot.

- θ Is BIOS configuration correct?

  → The boot device order is specified in the BIOS setup utility of the server. Use the BIOS setup utility to change the boot device order to boot the system from the CD-ROM drive first.

  <Menu to check: [Boot]>

- θ Is an error message displayed?

  → When an error occurs while the EXPRESSBUILDER is in progress, the following message appears.

```
Error occurred.
Error code [XX]
Terminate the program.

Confirm:[Enter]
```

After this message appears, check the error and take the appropriate corrective action according to the error code listed in the table below.

Error code	Cause and Remedy
MC	This EXPRESSBUILDER version is not designed for this server. Execute EXPRESSBUILDER on the compliant server.
NV	An access to the nonvolatile memory (NvRAM) is allowed.
PT	The hard disk is not connected or has failed. Check whether the hard disk is connected correctly.
FL	Read from and write to the floppy disk may be disabled. Replace the floppy disk with new one and execute EXPRESSBUILDER again.

Problems with Express Setup

<For Windows 2000/Windows NT 4.0>

The following message appears when you try to install Express Setup on a hard disk that has a smaller capacity than the specified partition size:

```
The specified partition size has exceeded the capacity of the hard disk.
Setup created the partition at the maximum size that can be reserved on the hard disk.
Setup will continue the process.
OK
```

→ This is not an error. Press **Enter** to continue the installation.

The following message appeared when copying files from the CD-ROM:

```
xxxxx : Not Ready xxxxxxxxxxxxxxxxxxZ
xxxxx(A),  xxxxx(R), xxxxx(F)
```

→ Press **R**. If this message continues to display after you continually press **R,** restart Express Setup from the beginning. If this error message continues to display, the CDROM drive may be defective and should be checked out by qualified personnel.

Express Setup terminated and requests input setup information.

→ There are errors in the specified setup information.
Follow the instructions and input the correct values. It is not necessary to cancel the installation. On Windows 2000, you might be asked to press Enter again after the last reboot of the setup.

[Complete] appears on the [Role of Computer] screen.

→ If you click [Complete] here, setup will select the default values of Express Setup and continue processing.

<The Default Value for Windows 2000>

The specification of network protocol	
Protocol :	TCP/IP[DHCP Specified]
Service :	Select sharing Microsoft network files and printer.
Client :	Microsoft network client.
Component :	SNMP, IIS (Excluding Professional)
Application :	ESMPRO Agent
	Express Report Service
	GAM Server (When connecting Mylex DAC)
	GAM Client (When connecting Mylex DAC)
	* DAC: Disk Array Controller

<The Default Value for Windows NT 4.0>

The specification of network

Adapter :	Standard network adapter
Protocol :	TCP/IP[DHCP specified]
Service :	SNMP, IIS(Excluding Workstation)
Application :	ESMPRO Agent
	Express Report Service
	GAM Server (When connecting Mylex DAC)
	GAM Client (When connecting Mylex DAC)
	* DAC: Disk Array Controller

[Complete] does not appear on [Role of Computer] screen.

→ [Complete] does not appear if the setup information file that has already been created is loaded.

→ [Complete] appears only when you first entered the [Role of Computer] screen. Once you go to the next screen from [Role of Computer], [Complete] will not appear even if you enter [Back] to go back to the [Role of Computer] screen.

Select [Use Existing Array] at [New/Existing RAID Configuration], but the OS is installed in the whole area of the disk.

→ Is there any other partition other than the partition to re-use (excluding maintenance area)? If a partition other than the one to re-use does not exist, setup will reserve the whole area of the disk to install Windows 2000 or Windows NT 4.0.

<For Windows 2000>

Specified to join the Domain, but the system is installed as Workgroup.

→ When the setup fails to join the Domain during the installation, it will install the system as Workgroup. Open [System] in Control Panel to specify joining the Domain.

Specified large value as partition size, but when Windows 2000 is started, the system partition is 2000MB.

→ Is the [Partition Size] specified by the value larger than the available area? If you want to create one partition for all areas of the hard disk (excluding the maintenance area), specify [All Area].

Windows 2000 started with a different display resolution from the specified value.

→ If the specified display resolution can not be used, the system will use the nearest value or the default value of the driver.

Entered the incorrect Product ID/CD key.

→ Even if you entered the incorrect Product ID/CD key, Express Setup will start. However, the setup will stop and asks you to re-enter the correct value. Also in this case, an input request will occur when rebooting after GUI setup is completed during Express Setup. If these 2 inputs are entered correctly, there is no problem with Windows 2000 setup.

Unable to configure the properties of the network adapter.

→ In Express Setup, you can not configure the properties of the Network adapter. Specify them from Control Panel after starting Windows 2000.

Windows 2000 is started with a Network adapter that has not been configured during Express Setup

→ Windows 2000 will install the recognized Network adapter configured as the default adapter. If you want to modify the properties of this adapter, you can do this from the Control Panel after starting Windows 2000. Also, a Network adapter that has been specified during Express Setup, but that is not installed, will not be setup however the protocol will be installed.

Two or more Network adapters are installed and configured with different protocols for each adapter, but all the protocols are configured for all adapters.

→ Each adapter is configured so that all the installed protocols can be used. Values that are not specified during Express Setup will all be specified by the default value.

When more than two Network adapters are specified, the detailed specification of TCP/IP protocol are all set to use DHCP.

→ When more than two Network adapters are specified, the detailed specification of the protocol for all adapters is set by default value. Re-specify the details from Control Panel.

Not more than two Network adapter are connected, but the detailed specification of the protocols are all set by default (e.g. Specified IP Address on TCP/IP, but DHCP is specified)

→ Are you specifying more than two protocols?
In this case, the situation will be the same as connecting more than two Network adapter, so the detailed specification of the protocol are all set by default.
Re-specify the details from Control Panel after starting the OS.

<for Windows NT4.0>

An error message displayed during the installation, and ESMPRO Agent and IIS (Internet Information Server) can not be installed.

→ Install ESMPRO Agent and IIS after completing the installation of Windows NT 4.0.

More than one network adapter is installed, but TCP/IP can not be specified for each network adapter.

→ Install with DHCP specified. In case you set a formal IP configuration, first install with DHCP specified and re-specify the value from Control Panel after the installation.

More than two Network adapters are installed, but only one network adapter is normally working after starting Windows NT 4.0.

→ Modify the properties of network adapter from Control Panel.

Following message appeared during the installation:

```
Lacking the quarter of system registry.
To increase the registry quarter, run [System] in Control Panel and click [Virtual Memory].
```

→ After logging on, follow the messages to modify the value of registry quarter.

Backup Domain Controller of Primary Domain Controller that has exceeded the router.

→ Express Setup can not create a Primary Domain Controller that has exceeded the router. Re-install it by manual setup.

Unable to join the domain on the Primary Domain Controller that has exceeded the router.

→ On Express Setup, you can not join the domain on the Primary Domain Controller that has exceeded the router. Install the system as Workgroup and join the domain from Control Panel after starting the OS.

Unable to uninstall Service Pack.

☐ Are you creating the partition to installed the OS with the size larger than 4GB?

→ To install Windows NT 4.0 on the partition larger than 4GB, Service Pack modules are necessary. In this case, you can not uninstall Service Pack even after starting Windows NT 4.0.

Unable to create the partition size larger than 4GB.

☐ Aren't you missing to input setup information?

→ Be sure to input [Company Name] on [User Information] screen.

Following message may appear on [explorer.exe] dialog box during the installation:

```
This Windows application can not respond to [End the Application].
It may be busy, waiting for the response from the user,
or terminating the execution.
```

☐ There is no problem about this issue.

→ Click [End the Application] and continue Express Setup.

Error Message during Disk Array Configuration

Refer to the manual that comes with the disk array controller for any trouble occurred on disk array in this system.

Problems with Master Control Menu

The master control menu fails to appear:

- Is your system Windows NT 4.0 or later, or Windows 95 or later?

  → The CD-ROM Autorun feature is supported by Windows NT 4.0 and Windows 95. The older versions do not automatically start from the CD-ROM.

- Is **Shift** pressed?

  → Setting the CD-ROM with **Shift** pressed down cancels the Autorun feature.

- Is the system in the proper state?

  → The menu may not appear depending on the system registry setting or the timing to set the CD-ROM. In such a case, start the Explorer and run \MC\1ST.EXE in the CD-ROM.

Problems with Configuration Diskette Creator

<Common to Windows 2000/Windows NT 4.0>

The bit map of the Configuration Diskette Creator window is not displayed correctly during setting of setup information. (When the Trekking command is used)

→ If the specified number of colors is fewer than 256 in the display setting, the bit map is not displayed correctly, but the setup information can be displayed correctly.

<Windows 2000>

The Point to Point tunneling protocol cannot be set.

→ The protocol is not supported at present. After installation, set the protocol through Control Panel. In this case, rebooting is not necessary.

The details of a network adapter cannot be set.

→ Configuration Diskette Creator is unable to set the details of network adapters. Start Windows 2000, and set the details through Control Panel.

<Windows NT 4.0>

Resolution cannot be set during setting of setup information.

→ When completing installation of Windows NT 4.0, set resolution through Control Panel.

More than one network board is connected during setting of setup information, but TCP/IP cannot be set for each network.

→ Perform the installation procedure during DHCP setting. To create a temporary IP configuration, perform the installation procedure during DHCP setting, and then set TCP/IP again through Control Panel.

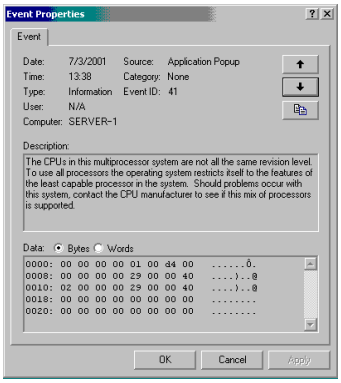
SAVING THE EVENT LOG FILE

This section describes how to save the event log.

IMPORTANT: If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

Windows 2000

NOTE: In a two-processor system, each processor may be of a different revision. If the operating system is Windows 2000, the following message may appear in the System Log of the Event Viewer. If this message is logged, it is not a problem and does not affect system operation.


Event Properties
Event
Date: 7/3/2001 Source: Application Popup
Time: 13:38 Category: None
Type: Information Event ID: 41
User: N/A
Computer: SERVER-1
Description:
The CPUs in this multiprocessor system are not all the same revision level. To use all processors the operating system restricts itself to the features of the least capable processor in the system. Should problems occur with this system, contact the CPU manufacturer to see if this mix of processors is supported.
Data: Bytes Words
0000: 00 00 00 00 01 00 d4 00 .....Ô.
0008: 00 00 00 00 29 00 00 40 ....)..@
0010: 02 00 00 00 29 00 00 40 ....)..@
0018: 00 00 00 00 00 00 00 00 ....
0020: 00 00 00 00 00 00 00 00 ....
OK
Cancel
Apply

1. Click [Management Tool] → [Event Viewer] from the Control Panel.
2. Select the type of the log to save.

   On [Application Log], the events related to the running application is archived. On [Security Log], the events related to the security is archived. On [System Log], the events occurred at the item which configures Windows 2000 system is archived.
3. Click [Save as...] in the [Run] menu.
4. Input the file name of archived log in the [File Name] box.
5. Select the type of the log file you want to save in the [File Type] list box and click [OK].

For more information, refer to Windows 2000 Online Help.

Windows NT 4.0

1. Click [Program] → [Management Tool] → [Event Viewer] from the Start pop-up menu.
2. Select the type of log you want to save from the [Log] menu.

   On [System], the events occurred at the item that configures Windows NT 4.0 system is archived. On [Security Log], the events related to the security is archived. On [Application Log], the events related to the running application is archived.
3. Click [Save as...] in the [Operation] menu.
4. Input the file name of archived log in the [File Name] box.
5. Select the type of the log file you want to save in the [File Type] list box and click [OK].

For more information, refer to Windows NT 4.0 Online Help.

SAVING SYSTEM CONFIGURATION INFORMATION

This section describes on how to save system information on hardware configurations and specifications.

> **IMPORTANT:** If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

Windows 2000

1. Select [Settings] in Start menu, and click on [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click on [Management Tool], and double-click on [Computer Management].

   The [Computer Management] dialog box appears.

3. Click on [System Tool] → [System Information].
4. Click on [Save as System Information File] in the [Operation] menu.
5. Input the file name to save in the [File Name] box.
6. Click [Save].

Windows NT 4.0

1. Click [Program] → [Management Tool] → [Windows Diagnostic Tool] from the Start pop-up menu.
2. Click [Save the Report] in the [File] menu.
3. Specify the details of the report you want to create.

   Specify [Range] as [All Tabs].
   Specify [Detailed Level] as [Perfect].
   Specify [Output Location] as [File].

4. Input the file name to save in the [File Name] box.
5. Click [OK].

SAVING DR. WATSON DIAGNOSTIC INFORMATION

Dr. Watson collects diagnostic information related to application errors. The location to save the information can be specified.

MEMORY DUMP

If an error occurs, the memory dump file should be saved to acquire important diagnosis information.

If you saved the dump to a DAT tape, write down that it is saved as "NTBackup" or "ARCServe" on the label. You can specify the location to save the diagnostic information. For more information, refer to "Specifying Memory Dump (Debug Information (refer to Chapter 4 for detail)".

IMPORTANT:

- Consult with your sales agent before dumping the memory. Dumping the memory while the server is in operation may affect the system operation.
- Restarting the system due to an error displaying a message indicating insufficient virtual memory may result in dumping improper data.

PREPARING FOR MEMORY DUMPING

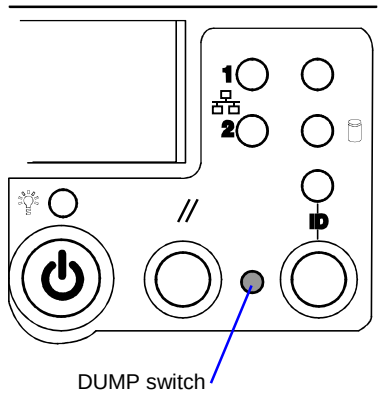
Memory dumping using the DUMP switch may disable restart of the server. If this should happen, you must force the server to shut down. This forced shutdown, however, is not available if "Enable" is selected for "Power Switch Inhibit" on the Security menu of the BIOS setup utility. This setting disables POWER switch operation.

Follow the procedure below to change the setting to enable the forced shutdown and restart of the server.

1. Power on the server and start the BIOS setup utility, SETUP.
2. Select "Disable" for "Power Switch Inhibit" in the Security menu.
3. Save the configuration data and exit the SETUP.

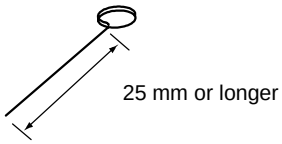
Saving the Dump File

Press the DUMP switch to save the dump file when an error occurs. Insert a metal pin (a straightened large paper clip) into the switch hole to press the DUMP switch.



Pressing the DUMP switch saves the dump file in the specified directory. (Memory dumping may not be available when the CPU stalls.)

IMPORTANT: Do not use a toothpick or plastic stick that is easy to break. Do not use any pin easily broken such as a toothpick or plastic pin. Use a pin having the length of 1 inch (25 mm) or longer.



Backup IPMI Information

This section describes on how to collect IPMI information. To collect the information, ESMPRO Agent must be installed.

1. Select [Program] → [ESMPRO Agent] → [ESRAS Utility] from the Start pop-up menu.

   The [ESRAS Utility] window appears.

2. Select [Latest Information] from the Tree View to collect the information of local computer.

   If the data is displayed, it means the data is collected normally.

3. Click [Backup Current IPMI Information] from the [File] menu.
4. Confirm the computer name to backup the information.
5. Specify the backup file name to save and the location to save it, and click [Backup].

RECOVERY FOR Windows 2000/Windows NT SYSTEM

If any file necessary for running the OS is damaged, use the following procedures to recover the system.

IMPORTANT:

- After recovering the system, see "Updating the System" in Chapter 4 and be sure to update the system.
  Also on Windows 2000, you need to update all the drivers after the system update. For more information, see "Installing and Setting Device Drivers" in Chapter 4.
- Concerning Windows NT 4.0, in case you updated the system, be sure to update the recovery information also, which will be the base of system recovery. (For more information on how to update the recovery information, see "Updating System Recovery Information" in Chapter 4.)
  Concerning Windows 2000, see "Installing and Setting Device Drivers" and "Updating the System" in Chapter 4 and be sure to update both the drivers and the system.
- If the hard disk can not be recognized, you can not recover the system.

Recovery Procedure - Windows 2000 -

Follow the procedure below and use the information in the disk, not the system recovery disk, to recover the system.

1. Turn on the power of the system.
2. Insert Windows 2000 CD into the CD-ROM drive of your server.
3. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)
4. <When no disk array controller is installed in the system>

   Proceed to step 8.

   <When disk array controller is installed>

   Press **F6** while the message "Setup is inspecting your computer's hardware configuration..." is displayed at the upper part of the screen.

NOTE: Nothing is changed on the screen through **F6** is pressed.

5. Press **S** when the following message appears:

```
Setup could not determine the type of one or more mass storage devices installed in your
system, or you have chosen to manually specify an adapter.
Currently, Setup will load support for the following mass storage devices.
```

   Select [Other] and press **Enter**.

6. Insert Windows 2000 OEM-DISK for EXPRESSBUILDER into the floppy disk drive and press Enter.

```
Please inset the disk labeled
manufacturer-supplied hardware support disk
into Drive A:
* Press ENTER when ready.
```

7. Select the proper RAID board and press **Enter**.
   - Mylex AcceleRAID 160 Disk Array Controller
   - Mylex AcceleRAID 352 Disk Array Controller
8. Press **R** to select the recovery option.
9. Select the keyboard.
10. If you are requested, press **R** to select system recovery procedure.
11. If you are requested, select either of the procedure below:

    [Manual Recovery] (Press **M**)

    Do not select this option unless you are a high-level user or a system administrator. If you use this option, you can recover the problems of system files, partition boot sector, and start-up environment.

    [Quick Recovery] (Press **F**)

    This option is very easy to use and the user does not need to do anything during the procedure. If you select this option, the system recovery disk program starts to recover the problems concerning system files, partition boot sector of system disk, and start-up environment (if multiple operating systems are installed on the system).
12. Follow the instruction displayed on the screen, and then press **L** at the screen which request you to insert system recovery disk. The system will be restarted once.

    NOTE: Starts the procedure without system recovery disk.

13. Repeat steps 1 to 10.

    The recovery procedure will be started.

    During the recovery, the missing files and the damaged files are replaced either to the files in C:\ I386 folder of hard disk or the files in systemroot\ Repair of the system partition. These replaced files do not reflect the changes of the configuration after the setup.

14. Follow the instruction displayed on the screen.

If you take a note of any file name in which trouble is detected during the procedure, it is useful to diagnose how the system has been damaged.

15. Terminates the procedure if the recovery is successful.

You can verify that the replaced files are correctly copied to the hard disk if the computer is restarted normally.

Recovery Procedure - Windows NT 4.0 -

If you are using Windows NT 4.0, follow the procedure below to recover the system.

System Recovery

Follow the procedure below and use the information in the disk, not system recovery disk, to recover the system.

1. Turn on the power of the system.
2. Insert Windows NT 4.0 CD into the CD-ROM drive of your server.
   Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)
3. After turning the system power on, press **F6** at either of the following situation:
   - The message "Setup is inspecting your computer's hardware configuration..." is being displayed.
   - The whole blue screen is being displayed.

   The message "Setup could not detect more than one mass storage driver which is installed in the system." and the input requesting screen will appear.

   If the input requesting screen does not appear, **F6** is not pressed correctly. Press **F3** to exit the setup and turn on the system power once again to start the setup.
4. Press **S**.
5. Select [Others] and press **Enter**.
6. Insert Windows NT 4.0 OEM-DISK for EXPRESSBUILDER #1 into the floppy disk drive and press Enter.
7. Select [Adaptec Ultra 160/m Family PCI SCSI Controller] and press **Enter**.

   The screen will go back to step 5.
8. If the disk array controllers are mounted on the device, repeat the steps 5 to 7 and select [Mylex AcceleRAID 160/352 Disk Array Controller].

   Follow the message displayed on the screen until [Welcome to Setup] screen appears.
9. Press **R** to select recovery option.
10. Select the task to execute and continue the procedure.
11. Follow the message and press Enter on the screen which request you to insert system recovery disk.

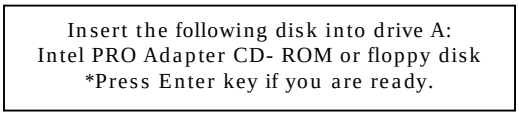
    The message "Windows NT is detected in the following directory on your hard disk." will appear.

12. Press **Enter**.
13. If the message asking whether or not select the hard disk inspection appears, press **Esc**.
14. Select the registry file to recover and continue the procedure.
15. Press **A**, and recover all the non-original files.
16. Follow the message and continue the procedure.

    If the recovery is successful, the procedure will be terminated.

    You can verify that the replaced files are correctly copied to the hard disk if the computer is restarted normally.

IMPORTANT: The following message may appear during system recovery. In that case, press **Esc** and cancel the procedure. Concerning the recovery of network driver, follow "Network-related Recovery".



Network-related Recovery

Follow the procedure below to recover network driver.

1. Click [Start] → [Settings] → [Control Panel].

   The Control Panel window appears.
2. Double-click [Network].

   The [Network] window appears.
3. Click [Adapter].
4. Select the network adapters you need from network adapter list displayed on the [Network Adapter], and click on [New].
5. Set the disk which includes network driver.
6. Enter the pass for network driver directory, and click on [Continue].

OFF-LINE MAINTENANCE UTILITY

The Off-line Maintenance Utility is an OS-independent maintenance program. When you are unable to start the OS-dependent ESMPRO to troubleshoot a problem, the Off-line Maintenance Utility can be used.

IMPORTANT:

- The Off-line Maintenance Utility is intended for use of your sales agent. The EXPRESSBUILDER CD-ROM and the Off-line Maintenance Utility Bootable FD you have created contain a file that describes operation of the utility, but do not attempt to use the utility by yourself. Contact your sales agent and follow instructions.
- Starting the Off-line Maintenance Utility disables any access from a client to the server.

Starting the Off-line Maintenance Utility

The Off-line Maintenance Utility may be started in many ways.

> **IMPORTANT:** Do not start the Off-line Maintenance Utility while the server is in successful operation.

- From the CD-ROM

  Set the EXPRESSBUILDER CD-ROM in the CD-ROM drive and reboot the system.

  After the menu is displayed on the screen, select "Tools" - "Off-line Maintenance Utility".

  The Off-line Maintenance Utility program starts from the CD-ROM.

- From the floppy disk

  Set the Off-line Maintenance Utility Bootable FD in the floppy disk drive and reboot the system.

  The Off-line Maintenance Utility program starts from the boot disk.

  The Off-line Maintenance Utility Bootable FD is created by selecting "Tools" - "Create Support FD" on the EXPRESSBUILDER.

- Manual start (by pressing **F4**)

  When the Off-line Maintenance Utility is installed, press **F4** while the start-up screen of the server is on screen. The Off-line Maintenance Utility starts from the hard disk.

Features of Off-line Maintenance Utility

The Off-line Maintenance Utility provides the following features. (Available features vary depending on the way you started the Off-line Maintenance Utility.)

> **IMPORTANT:** See the on-line help for details of the Off-line Maintenance Utility. For further information, ask your sales agent.

- IPMI Information Viewer

  Provides the functions to view the system event log (SEL), sensor data record (SDR), and field replaceable unit (FRU) and to make a backup copy of them.

  Using this feature, you can find system errors and events to determine a maintenance part.

- BIOS Setup Viewer

  Provides the functions to export the current configuration data defined with the SETUP utility to a text file.

- System Information Viewer

  Provides the functions to view information on the processor and the BIOS and export it to a text file.

- System Information Management

  Provides the function to make a back-up copy of you data.

  Without the backup data, the system-specific information and/or configuration may not be restored.

  Only the authorized personnel is allowed to restore the backup data.

- Start of Utilities

  With the EXPRESSBUILDER, you can start the following utilities installed in the maintenance partition.

  – System Management function

  – System Diagnostics

  – Maintenance Partition Update

- Chassis Identify

  The lamp on the front panel is flashed for five seconds. This is convenient if you have to distinguish a machine among many machines on the rack.

RESETTING THE SERVER

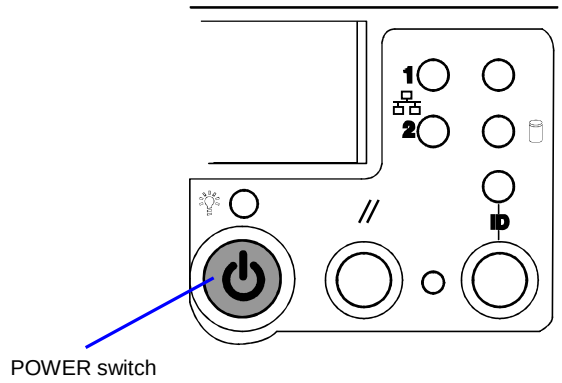
If the server halts before starting the OS, press and hold **Ctrl** and **Alt** and press **Delete**. This restarts the server.

IMPORTANT: Resetting the server clears the DIMM memory and the data in process. To reset the server when it is not frozen, make sure that no processing is in progress.

FORCED SHUTDOWN

Use this function when an OS command does not shut down the server, the POWER switch does not turn off the server, or resetting does not work.

Press and hold the POWER switch on the server for at least four seconds. The power is forcibly turned off. To turn on the power back again, wait approximately 10 seconds after turning off the power (forced shutdown).



IMPORTANT: If the remote power-on function is used, cycle the power once to load the OS, and turn off the power again in the normal way.

Chapter 7

Upgrading Your Server

- This chapter provides you with instructions for upgrading your system with an additional processor, optional memory, options cards, and peripheral devices.

IMPORTANT:

- Optional devices described in this chapter may be installed or removed by the user. However, NEC does not assume any liability for damage to optional devices or the server or malfunctions of the server resulted from installation by the user.
- Make sure to use only optional devices and cables authorized by NEC. Repair of the server due to malfunctions, failures, or damage resulted from installing such devices or cables will be charged.
- When you make changes to the hardware configuration, make sure to update the system configuration information.

SAFETY NOTES

Observe the following notes to install or remove optional devices safely and properly.

⚠ WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury.

- Do not disassemble, repair, or alter the server.
- Do not look into the CD-ROM drive.
- Do not remove the lithium battery.
- Disconnect the power plug before working with the server.

⚠ CAUTION



Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage.

- Do not lift the server only by yourself. Two people are required to lift this server.
- Do not install the server on the rack with the cover removed.
- Be careful not to pinch your fingers between mechanical components.

⚠ WARNING

The DC push-button on/off switch on the front panel does not turn off the system AC power. Also, +5vdc is present on the system board whenever the AC power cord is connected between the system and an AC outlet. Before doing the procedures in this manual, make sure that your system is powered off and unplug the AC power cord from the back of the chassis. Failure to disconnect power before opening your system can result in personal injury and equipment damage.

⚠ CAUTION

The server management logic on your system board monitors and logs system voltage changes. When powering down your system you may experience a 1–5 second delay from the time you press the push-button power on/off switch on the front panel and your system powering down. This is normal system operation and is required by the server management logic.

CAUTION

Operating your system with the top cover removed can damage your system components. For proper cooling and airflow, always replace the top cover before powering on your system.

Note: Your system error log will be lost, if your system ac power source is off or disconnected.

ANTI-STATIC MEASURES

The server contains electronic components sensitive to static electricity. Avoid failures caused by static electricity when installing or removing any optional devices.

- Wear a wrist strap (an arm belt or anti-static glove).

  Wear a wrist strap on your wrist. If no wrist strap is available, touch an unpainted metal part of the cabinet before touching a component to discharge static electricity from your body.

  Touch a metal part regularly when working with components to discharge static electricity.

- Select a suitable work space.
  - Work with the server on the anti-static or concrete floor.
  - When you work with the server on a carpet where static electricity is likely to be generated, make sure to take anti-static measures beforehand.
- Use a work table.

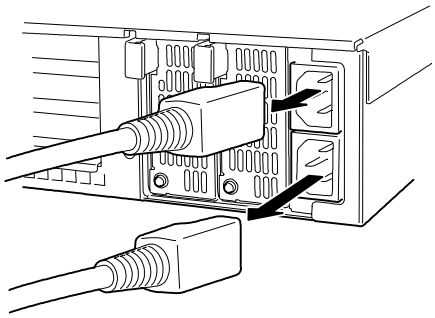
  Place the server on an anti-static mat to work with it.

- Cloth
  - Do not wear a wool or synthetic cloth to work with the server.
  - Wear anti-static shoes to work with the server.
  - Remove any jewels (a ring, bracelet, or wrist watch) before working with the server.
- Handling of components
  - Keep any component in an anti-static bag until you actually install it to the server.
  - Hold a component by its edge to avoid touching any terminals or parts.
  - To store or carry any component, place it in an anti-static bag.

PREPARING FOR INSTALLATION AND REMOVAL

Follow the procedure below to prepare for installing or removing components.

1. Shut down the operating system.
2. Press the POWER switch to power off the server (the POWER lamp goes off).
3. Remove all cables and power cords from the server.



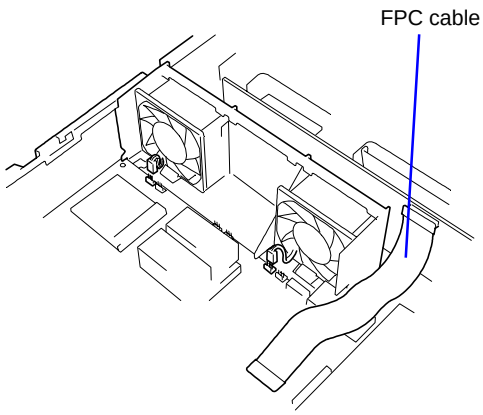
NOTE: You will need a Phillips screwdriver and a flat-blade screwdriver to install or remove components in this server.

CONFIRMATION AFTER INSTALLATION/REMOVAL

Confirm the following after installing an option or removing a component.

- Install removed components in their original locations

  Install components and cables, which were removed and disconnected for the addition of an option, exactly as they originally were. Re-assembling the server without a component being installed or a cable being disconnected causes the server to malfunction. In particular, make sure that the FPC cable is firmly connected when having removed or replaced internal components. Be sure to securely install all components and connect all cables.



- Confirm that no parts such as screws are left in the server

  Confirm that particularly conductive parts such as screws are not left in the server. Turning on the power with a conductive part on the system board or cable terminal causes the server to malfunction.

- Confirm the server is being adequately cooled.

  Confirm that ventilating holes are not covered with an internally connected cable. Insufficient cooling raises the internal temperature, which causes the server to malfunction.

- Confirm system operation

  Adding some additional devices may require you to run the diagnostic utility or BIOS setup utility to ensure the device is installed correctly.

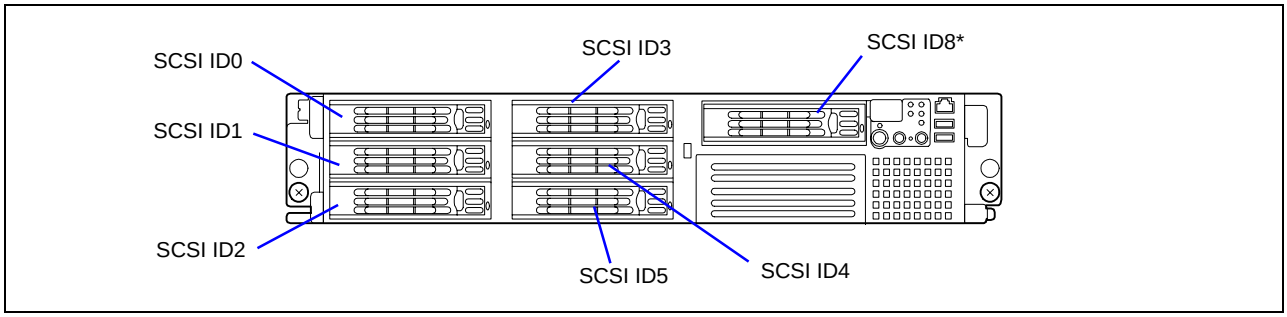
DEVICE INSTALLATION OR REMOVAL PROCEDURE

Install or remove a component from the server using the following procedure.

Hard Disk Drive

The server has seven device bay slots in the disk bay of the front of the server to install hard disks with the SCA2 interface (Ultra 160 SCSI.) Up to six hard disk drives can be installed in the standard configuration. If using the flex bay to install a hard disk, you can install up to seven hard disk drives in the server.

All seven slots may contain a hard disk approximately 25.4 mm (1 inch) high. The SCSI IDs of ID0 through ID5 are always assigned to hard disks as shown below.



*The figure shows the SCSI IDs when the flex bay contains a hard disk drive instead of the floppy disk or CD-ROM drive.

The hard disk drive bays are connected to the SCSI connector on the system board when the server is shipped. To use the hard disk drives in a disk array configuration, reconnect the cable from the connector on the system board to the disk array controller connector. For the cable reconnection, see "Disk Array Controller".

A dummy tray is installed in the hard disk drive bays except the one with SCSI ID0 defined. The purpose of a dummy tray is to increase the cooling effect in the server. Always install a dummy tray in slots not containing a hard disk drive.

Installation

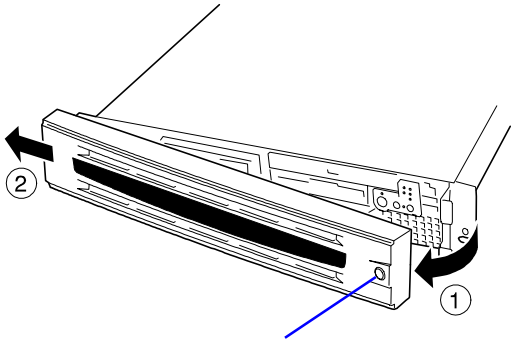
Perform the following steps to install a hard disk drive. This procedure applies to all the hard disk drive bays. See the next section for the procedure installing a hard disk drive in the flex bay.

> **NOTE:** Any hard disk can be installed or removed in or from the server after removing the front bezel.

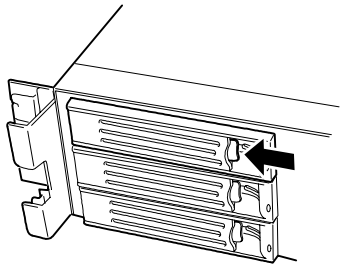
> **IMPORTANT:** In the disk array configuration, all hard disks in the array must have the same specifications, including drive capacity.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Unlock the front bezel with the security key and remove the front bezel.
3. Locate the slot in which you are going to install a hard disk drive.

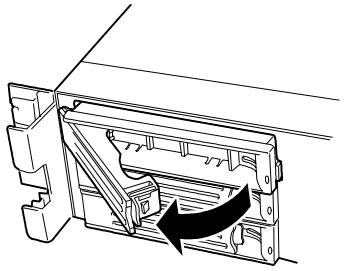
   The server has six slots. Install hard disk drives in ascending order of the SCSI ID numbers. The SCSI IDs assigned to the slots are all determined.



4. Release the lock by pushing the dummy tray lever.

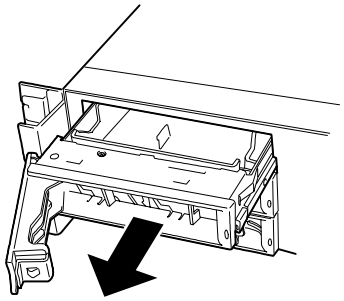


5. Pull the dummy tray handle.



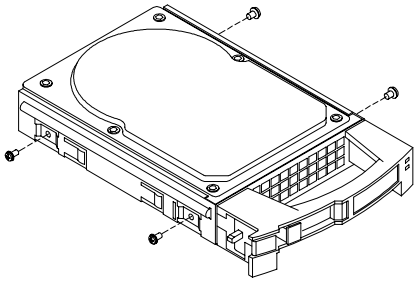
6. Remove the dummy tray.

IMPORTANT: Keep the dummy tray for future use.



6579-00

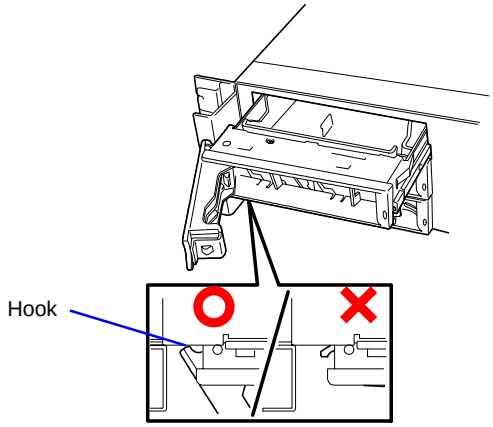
7. Secure the drive in the drive carrier with the four screws supplied with the disk drive.



8. Firmly hold the additional hard disk drive (with the tray provided) and handle, and insert it into the slot.

IMPORTANT:

- Push the hard disk drive until the handle hook butts to the frame.
- Carefully hold the hard disk drive with both hands.

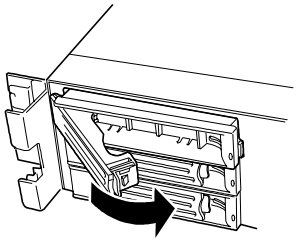


9. Slowly close the handle.

The handle is locked when a "click" is heard.

IMPORTANT: Be careful not to get your finger caught between the handle and tray.

NOTE: Confirm that the handle is hooked to the frame when having inserted the hard disk drive.



10. Power on the server, start the SETUP utility, select [Boot] → [Hard Disk], and set the boot priority in the submenu.

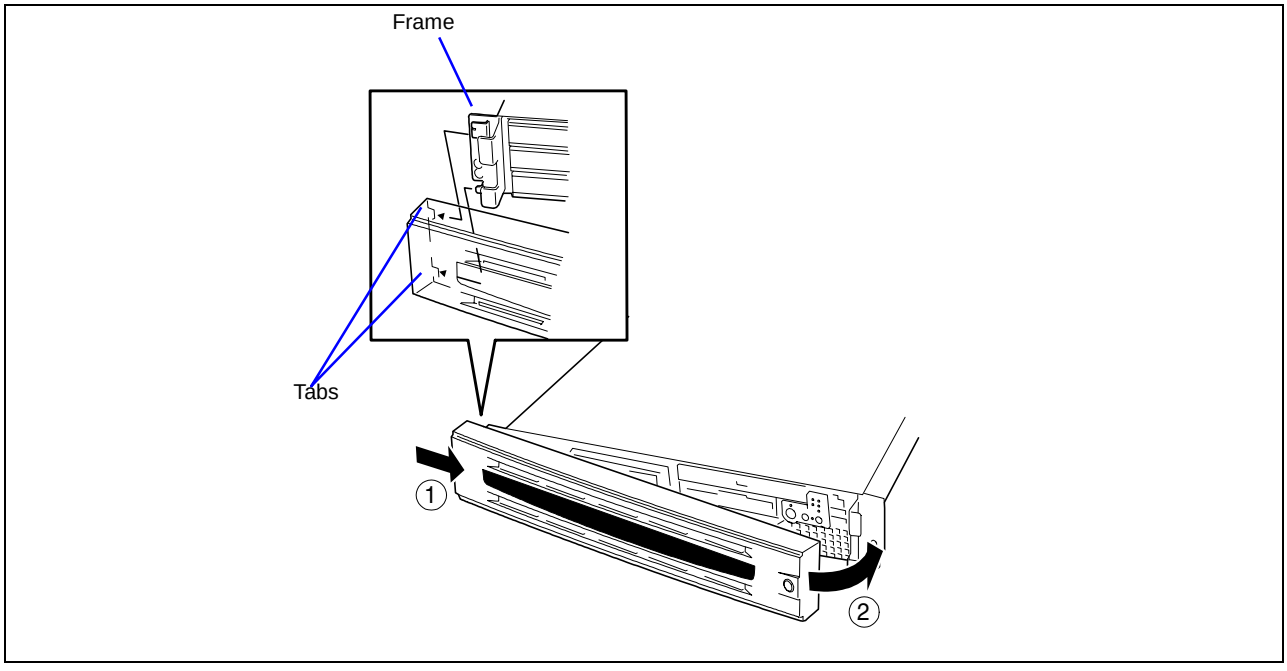
This operation is necessary because installing an additional hard disk drive clears the current setting of the boot priority.

IMPORTANT:

- To add a hard disk during operation of the Global Array Manager (GAM), click the Scan Device key after about 90 seconds have passed from the installation of the hard disk. If you click the Scan Device key after executing the Expand Array, the added disk appears correctly.
- If a hard disk is added to the server operating in RAID1 by using the expand array feature, the RAID is automatically changed to RAID0+1. (However, it is not possible to set RAID0+1 directly by using a specific utility.)

11. Install the front bezel you removed in step 2.

There are tabs on the left side of the front bezel. Engage the tabs with the server frame, install the front bezel, and lock it with the security key.

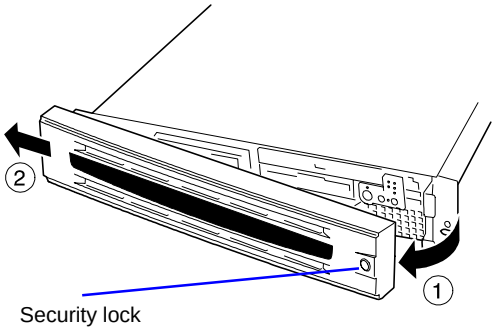


Installing a Hard Disk Drive into the Flex Bay

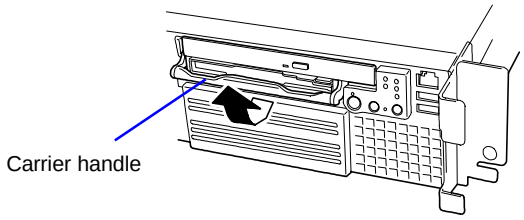
This section explains the procedure for removing the floppy disk or CD-ROM drive installed in the flex bay and then installing the seventh hard disk drive in the bay (SCSI ID 8).

> **NOTE:** You cannot use the floppy disk or CD-ROM drive while the flex bay contains a hard disk drive.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Unlock the front bezel with the security key, and remove the front bezel.

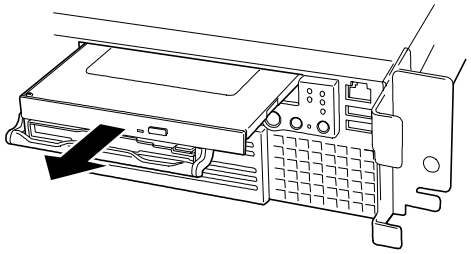


3. Lift up the carrier handle at the bottom of the floppy disk drive.

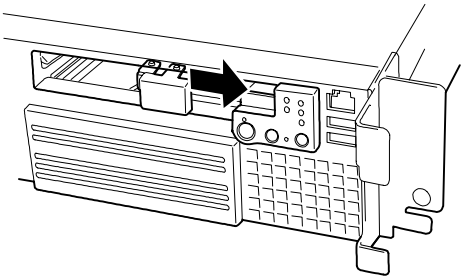


4. Hold the carrier handle, and pull it out straight to remove the floppy disk or CD-ROM drive from the flex bay.

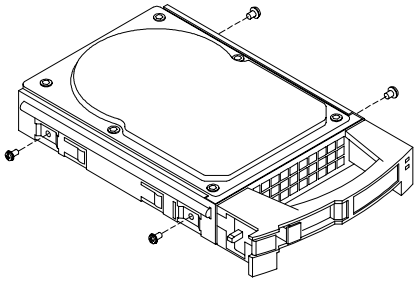
IMPORTANT: Keep the removed floppy disk or CD-ROM drive for future use.



5. Install the provided spacer on the server.



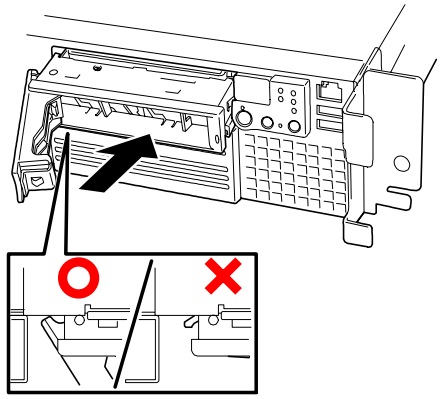
6. Secure the drive in the drive carrier with the four screws supplied with the disk drive.



7. Firmly hold the hard disk drive (with the tray provided) and handle, and insert it into the slot.

IMPORTANT:

- Push the hard disk drive until the handle hook butts to the frame.
- Carefully hold the hard disk drive with both hands.



8. Slowly close the handle.

   The handle is locked when a "click" is heard.

IMPORTANT: Be careful not to get your finger caught between the handle and tray.

NOTE: Confirm that the handle is hooked to the frame when having inserted the hard disk drive.

9. Power on the server, start the SETUP utility, select [Boot] → [Hard Disk], and set the boot priority in the submenu.

   This operation is necessary because installing an additional hard disk drive clears the current setting of the boot priority.

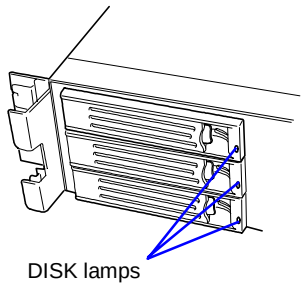
10. Install the front bezel you removed in step 2.

    There are tabs on the left side of the front bezel. Engage the tabs with the server frame, install the front bezel, and lock it with the security key.

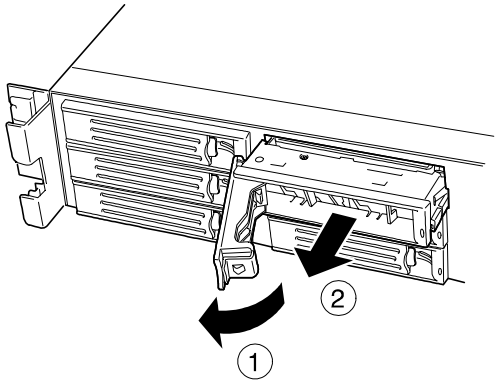
Removing a Hard Disk Drive

Perform the following steps to remove a hard disk drive.

> **NOTE:** If removing a failed hard disk drive, confirm the slot in which the DISK lamp of the hard disk drive is amber before starting the removal.



1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Unlock the front bezel with the security key, and remove the front bezel.
3. Push the lever to unlock, and put the handle down.
4. Firmly hold the handle and hard disk drive, and pull out the hard disk drive.
5. If using the server with the hard disk drive removed, install the dummy tray in the empty slot.



6. Power on the server, start the SETUP utility, select [Boot] → [Hard Disk], and set the boot priority in the submenu.

   This operation is necessary because installing an additional hard disk drive clears the current setting of the boot priority.

7. Install the front bezel you removed in step 2.

When the hard disks are in the disk array configuration, you can use the auto-rebuild feature to restore the data that was on the removed hard disk drive.

The auto-rebuild feature is available for the RAID1, RAID5, or RAID0+1 disk array configurations.

Auto-rebuild is carried out when you hot-swap a failed hard disk with a new one (replacing the disk drive with a new one while the server is powered up). The DISK lamp flashes green and amber alternatively to indicate the auto-rebuild is in process.

IMPORTANT:

- When auto-rebuild fails, the DISK lamp lights amber. Remove and install the hard disk again to restart auto-rebuild.
- If the disk array monitoring utility is installed, it may display or act as follows. If the DISK lamp does not light in amber after auto-rebuild, however, auto-rebuild has completed successfully.
  - Displays "Rebuild was cancelled" on the screen while auto-rebuild is in progress.
  - Appears to stop and restart auto-rebuild.

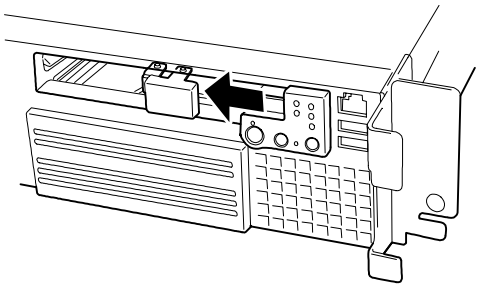
Observe the following notes for auto-rebuild.

- Do not power off the server during the period of time between a hard disk error and completion of auto-rebuild.
- When you removed a hard disk, wait at least 90 seconds before re-installing the hard disk.
- Do not replace another hard disk while rebuilding is in progress. (The DISK lamp flashes in green and amber alternatively while rebuilding the hard disk.)
- Perform the above procedure when replacing the hard disk drive in the flex bay.

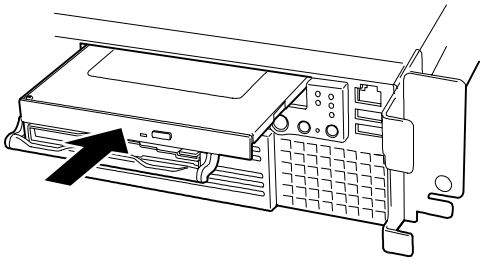
Inserting the Floppy Disk or CDROM Drive into the Flex Bay

The following explains the procedure for removing the hard disk drive and then installing the floppy disk or CD-ROM drive in the bay:

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Unlock the front bezel with the security key and remove the front bezel.
3. Remove the hard disk drive.
4. Remove the spacer.



5. Insert the floppy disk or CD-ROM drive straight into the flex bay.



6. Power on the server, start the SETUP utility, and make the following settings:

   This operation is necessary because installing the floppy disk drive or CD-ROM drive clears the current settings.

   – Select [Boot] → [Boot Device Priority] → [ATAPI CD-ROM Drive] → [1st Boot Drive].

   – Select [Boot] → [Boot Device Priority] → [Removable Drive] → [2nd Boot Device].

   – Select [Boot] → [Hard Disk], and set the new boot priority.

7. Install the front bezel you removed in step 2.

   There are tabs on the left side of the front bezel. Engage the tabs with the server frame, install the front bezel, and lock it with the security key.

Power Supply Unit

Even if a single power supply unit fails, the server can continue its operation without interruption (redundancy feature).

Installation

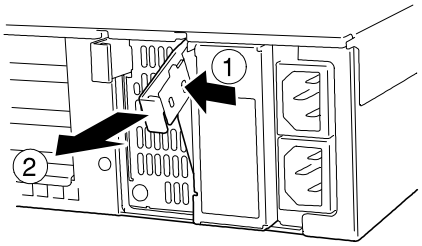
Perform the following steps to install a power supply unit:

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

   IMPORTANT: Be sure to turn off the power. Failure to do so causes the server to malfunction or fail.

2. Pull the cable arm toward the rear of the server, and locate the slot for installing an optional power supply unit.
3. Hold and pull the handle of the blank cover.

   The blank cover is unlocked.

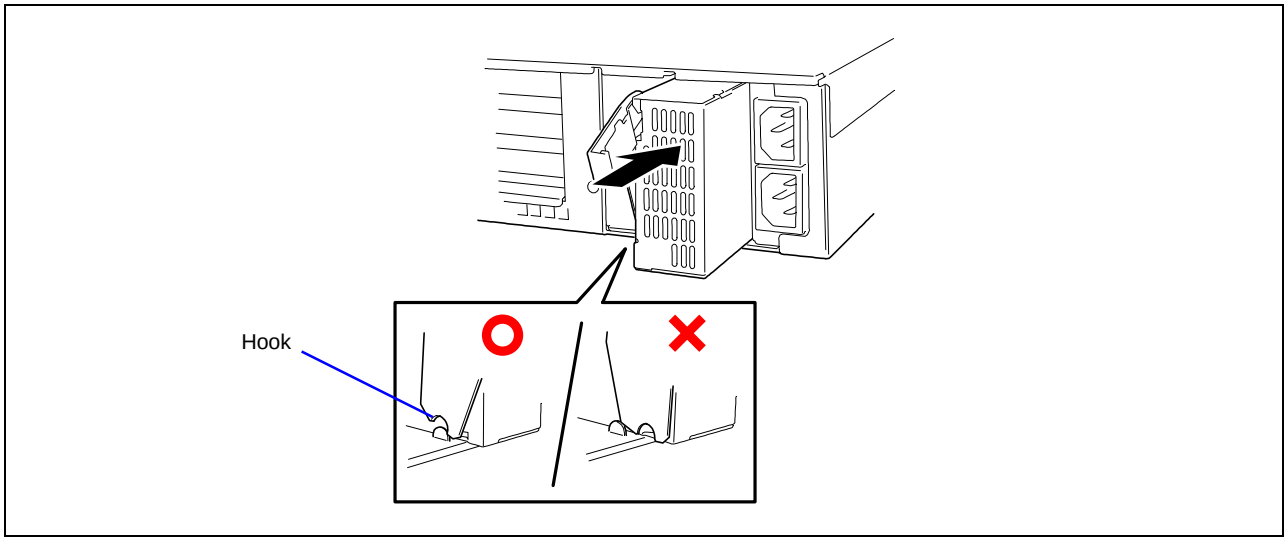


4. Remove the blank cover.

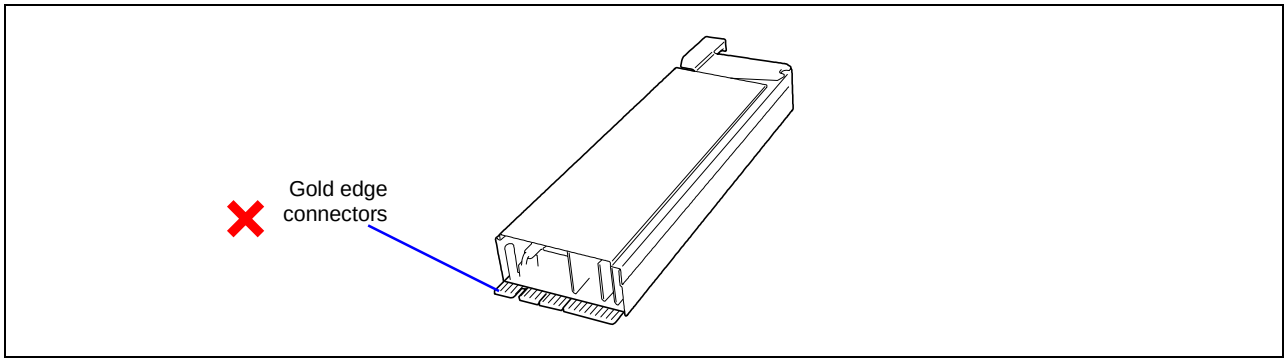
   IMPORTANT: Keep the removed blank cover for future use.

5. Insert the power supply unit.

NOTE: Confirm that the handle is securely hooked.

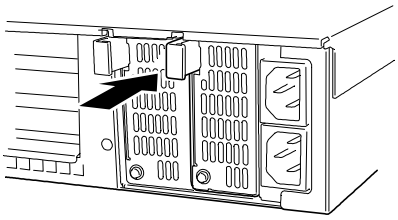


IMPORTANT: Do not touch the terminals of the power supply unit.



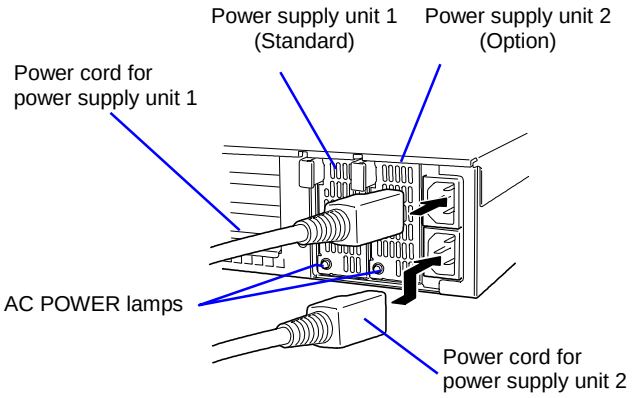
6. Firmly push the handle.

The power supply unit is locked when a "click" is heard.



7. Connect two power cords.

Use the power cord provided with the standard power supply unit and the one provided with the optional unit. The AC POWER lamps flash when the power cords are connected.



8. Power on the server.

The AC POWER lamps go on.

9. Confirm, by the STATUS lamp or on the POST screen, that there are no errors related to the power supply units.

See Chapter 6 for details on the error messages.

If the AC POWER lamps are off, reinstall the power supply units. If the same error message still appears, contact your sales representative.

Replacing a Failing Power Supply Unit

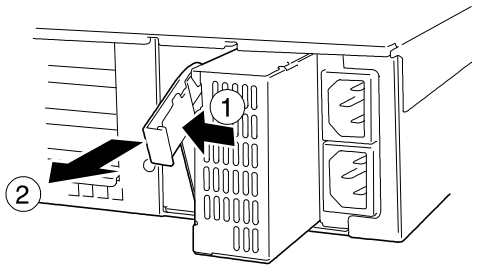
Replace only a failing power supply unit.

> **IMPORTANT:** Do not remove a power supply unit operating normally.

> **NOTE:** If one power supply unit fails and the server contains two power supply units in a redundant configuration, the failing power supply unit can be replaced with the system operating in the (power-on state). (If your server is running in the redundant power configuration, skip Step 1 in the following procedure.)

1. Shutdown the system, and press the POWER switch to turn off the power.
2. Locate the failing power supply unit by the AC POWER lamp on the rear of each power supply unit. (The lamp of the failing power supply unit is amber.)
3. Hold and pull the handle of the failing power supply unit.

   The power supply unit is unlocked.
4. Remove the power supply unit.



5. If operating the server with a single power supply unit without installing a new one, install the cover you removed in step 4 of installation procedure.

> **IMPORTANT:** To maintain the cooling effect in the server, install the blank cover in the slot not containing a power supply unit.

6. Install the new power supply unit following Steps 5 to 9 of "Installation", and confirm that the power supply unit is installed normally.

> **NOTE:** If one of the two power supply units of the server is replaced while the power is on, the POWER lamp of the new power supply unit goes on. (If it is replaced while the power is off, the lamp flashes. The lamp goes on when the power is turned on.)

Server ~ Pull-out from the Rack ~

The server needs to be pulled out from the rack for installing/removing any components other than the hard disk drives and power supply units.

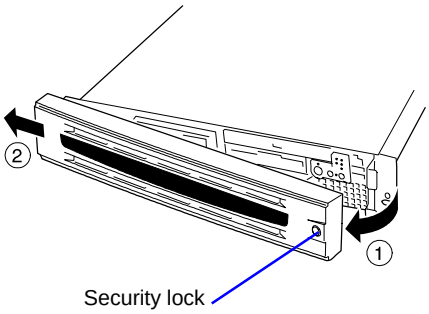
⚠ CAUTION



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury.

Do not install the server on a rack with the covers removed.
Do not pinch your finger between mechanical components.
Do not pull the server out from the rack if the rack is unstable.
Do not have more than one device pulled out from the rack at a time.

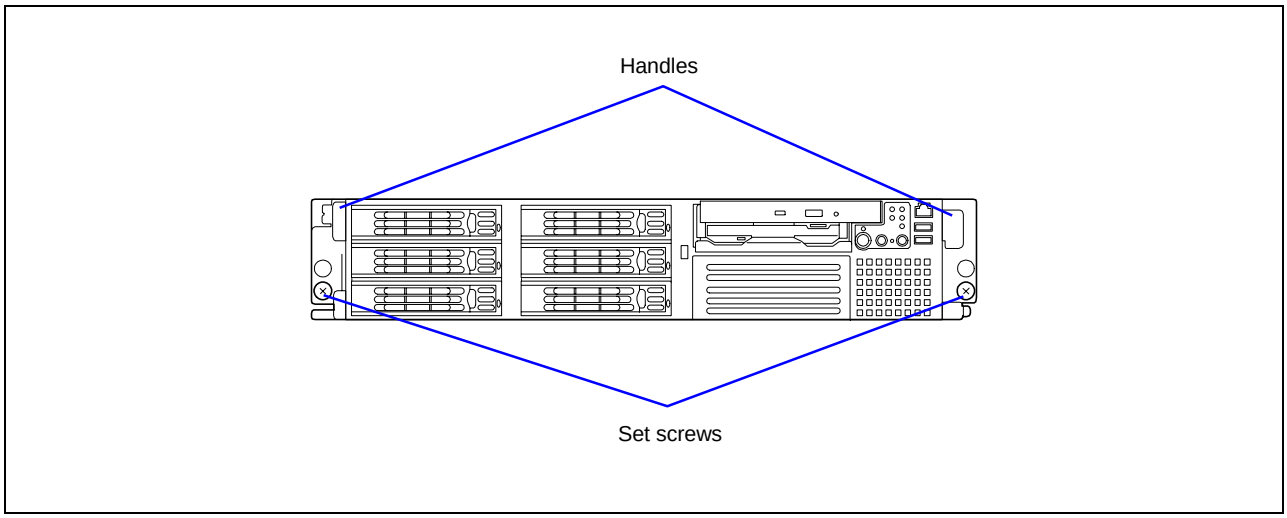
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Unlock the front bezel with the security key and remove the front bezel.



3. Loosen the two set screws on the front panel.

4. Hold the handles and slowly pull out the server from the rack.

   The server is latched when a "click" is heard.



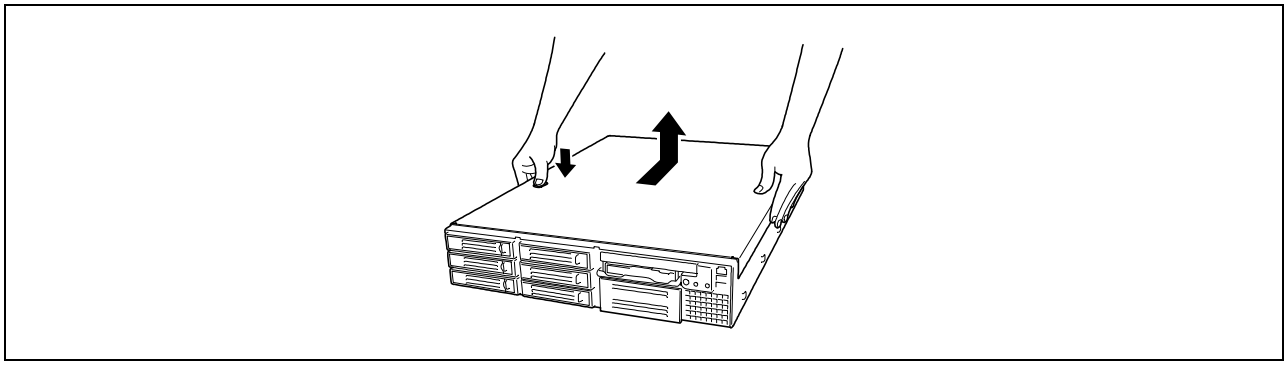
NOTE: When inserting the server back into the rack, push the release levers on the rails on the sides of the server to unlatch the server. Be very careful not to get your finger caught in doing so.

Top Cover

Open the top cover when installing/removing an internal device or reconnecting an internal cable.

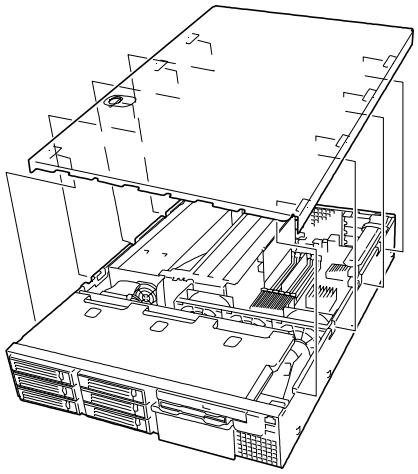
Removal

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Slide the top cover toward the rear of the server while pressing the lock button on the cover.
4. Lift off the top cover from the server.

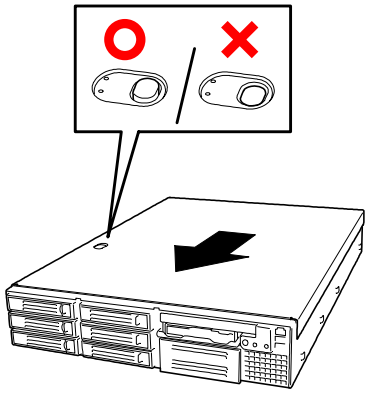


Installation

When installing the top cover, confirm that the tab of the cover is securely inserted into the slot in the server frame.



1. Slide the top cover toward the front of the server. The top cover is locked when a "click" is heard. At this time, check the release button for normal state. When the top cover is securely locked, the release button springs up. If the release button is held down (hollow state), slide the top cover toward the front of the server again. If the top cover is not locked yet, remove the cover, and then install it again.



DIMMS

Install additional DIMMs (Dual Inline Memory Module) to the DIMM sockets on the system board in the server. The system board is provided with six DIMM board slots.

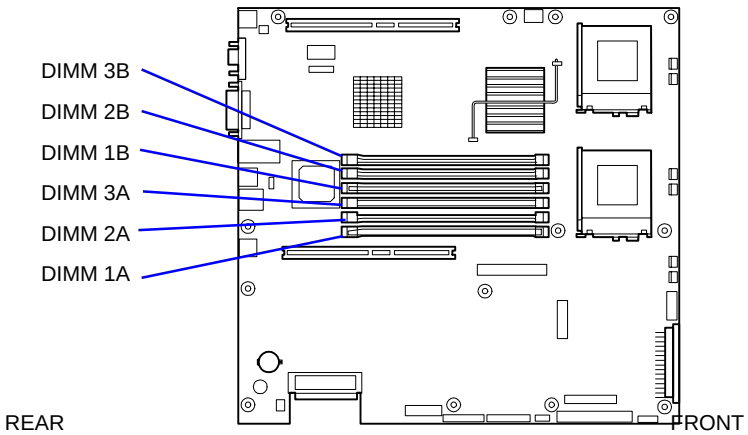
NOTE: Up to 6GB of memory (1GB DIMM x 6) can be installed. 128MB DIMMs are installed in DIMM slots #1A and #1B at shipment.

IMPORTANT:

- DIMMs are extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling a DIMM. Do not touch the DIMM terminals or on-board parts by a bare hand or place the DIMM directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
- Make sure to use DIMMs authorized by NEC. Installing third-party DIMMs may cause a failure of a DIMM or a failure in the server.

DIMM Installation Order

Install two DIMMs in ascending order of paired-slot numbers.



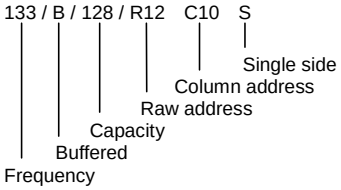
System board

IMPORTANT: Install two additional DIMMs for each BANK (*1) as the server uses interleaved memory. If DIMMs of different specifications (*2) are installed in a BANK, the server may not operate normally.

*1 A BANK is a unit of two DIMM slots. Each pair of DIMM slots #1A and 1#B (DIMM group #1), #2A and #2B (DIMM group #2), and #3A and #3B (DIMM group #3) in the figure is a BANK. (The symbols are also printed on the system board.)

*2 DIMM specification is shown on the label attached to the DIMM as follows:

Example: Frequency of 133 MHz, buffered, capacity of 128 MB, raw address of 12 bits, column address of 10 bits, and single side



DIMM Installation Procedure

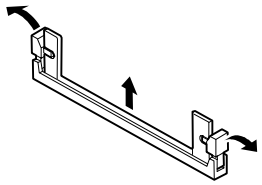
Use the following procedure to install a DIMM.

> **IMPORTANT:** The server supports DIMMs of only the low-profile type (30 mm (1.2 inches) in height). It does not support DIMMs exceeding the specified height.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Open the top cover.
4. Remove the DIMM cover from the socket into which you are going to install a DIMM.

   Open the levers at both ends of the socket. The cover is released from the socket.

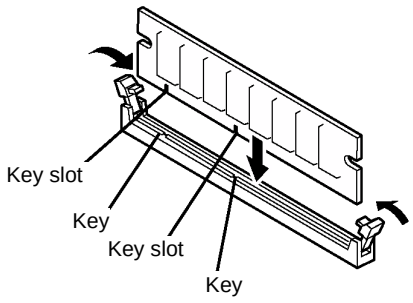
> **IMPORTANT:** Save the removed DIMM cover for future use.



5. Push the DIMM straight into the socket.

> **NOTE:** Make sure of the orientation of the DIMM.
> Each DIMM has a slit on the terminal side for preventing wrong insertion.

The levers automatically close when the DIMM is inserted into the socket.



6. Install the components removed in steps 2 and 3.
7. Power on the server and verify that POST displays no error messages.

   If POST displays an error message, take note of the message and see the POST error messages listed in Chapter 6.
8. Start the SETUP and select [Advanced] → [Memory Configuration] to verify that the installed DIMM shows the status "Installed". (See Chapter 3 or details.)
9. Select "Yes" for [Reset Config Data] on the [Advanced] menu.

   This setting is required to change the hardware configuration data. See Chapter 3 for details.
10. If your operating system is Windows 2000 or Windows NT 4.0, set the paging file size to the recommended value or a greater value as shown below. See Chapter 4 for details.
    - For Windows 2000: Total memory size × 1.5
    - For Windows NT 4.0: Total memory size + 12MB

    If your operating system is NetWare, reserve the disk space in the MS-DOS partition for a memory dump.

DIMM Removal Procedure

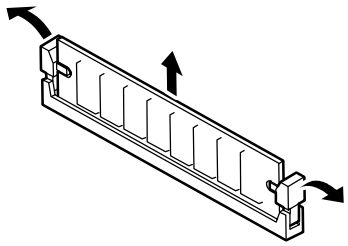
Remove the DIMM depending on the following procedure.

NOTES:

- To remove the failed DIMM, check the error message appearing in POST or ESMPRO to identify the DIMM socket (group) in which the failed DIMM is installed.
- The server operates only when at least two DIMMs are installed.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Open the top cover.
4. Open the levers at both sides of the socket from which you remove the DIMM.

   The DIMM is unlock and ready for removal.



5. Reinstall all parts removed in Step 2 and 3.

   Power on the server and verify that POST displays no error messages.

   If POST displays an error message, note on the message and see the POST error messages listed in Chapter 6.
6. Start the SETUP and select [Advanced] → [Memory Configuration] → [Memory Retest] → [Enabled] to clear the error information of the removed DIMM. (See Chapter 3 for details.)
7. Select "Yes" for [Reset Config Data] on the Advanced menu.

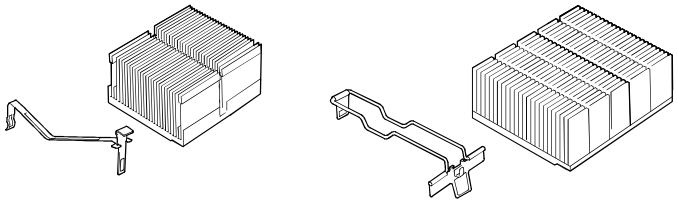
   This setting is required to change the hardware configuration data. See Chapter 3 for details.

Processor (CPU)

The server may have another CPU installed in addition to the standard CPU (Intel Pentium III Processor).

IMPORTANT:

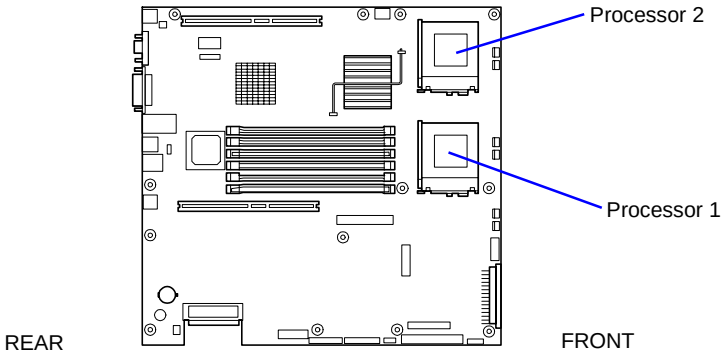
- The CPU is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the CPU. Do not touch the CPU pins by a bare hand or place the CPU directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
- Do not operate the system until confirming that the additionally installed CPU is in normal state.
- Make sure to use the CPU authorized by NEC. Installing a third-party CPU may cause a failure of the CPU as well as the server.
- The heat sink provided with the optional CPU and the standard heat sink provided with the server have a different shape. The installation/removal methods are also different between the two heat sinks. However, the CPUs have the same cooling function.



Standard heat sink
provided with the server

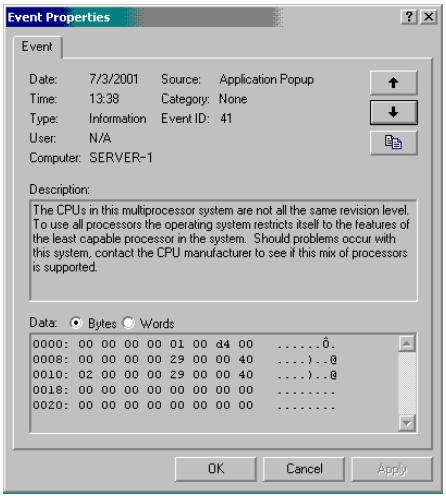
Heat sink
provided with the optional CPU

* The wire clip is installed on the heat sink at purchase.



System board

NOTE: If the different revision of the processor is installed in the multiprocessor system, Windows 2000 logs the following information every startup. If this message is logged, it is no problem for operation.

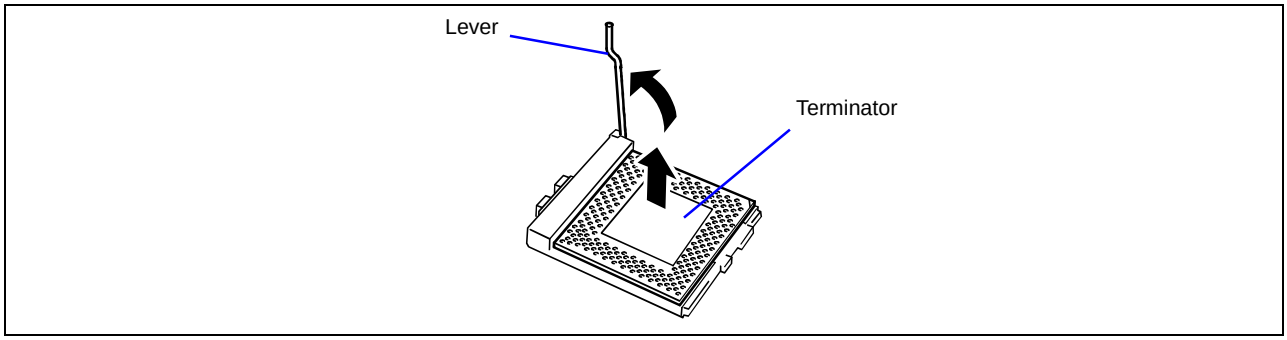

Event Properties
Event
Date: 7/3/2001 Source: Application Popup
Time: 13:38 Category: None
Type: Information Event ID: 41
User: N/A
Computer: SERVER-1
Description:
The CPUs in this multiprocessor system are not all the same revision level. To use all processors the operating system restricts itself to the features of the least capable processor in the system. Should problems occur with this system, contact the CPU manufacturer to see if this mix of processors is supported.
Data: Bytes Words
0000: 00 00 00 00 01 00 d4 00 ......Ô.
0008: 00 00 00 00 29 00 00 40 ....)..@
0010: 02 00 00 00 29 00 00 40 ....)..@
0018: 00 00 00 00 00 00 00 00 ....
0020: 00 00 00 00 00 00 00 00 ....
OK
Cancel
Apply

Installing a CPU

Perform the following steps to install a CPU. The EXPRESSBUILDER CD, provided with the server, is necessary for confirming that the additionally installed CPU is in the normal state.

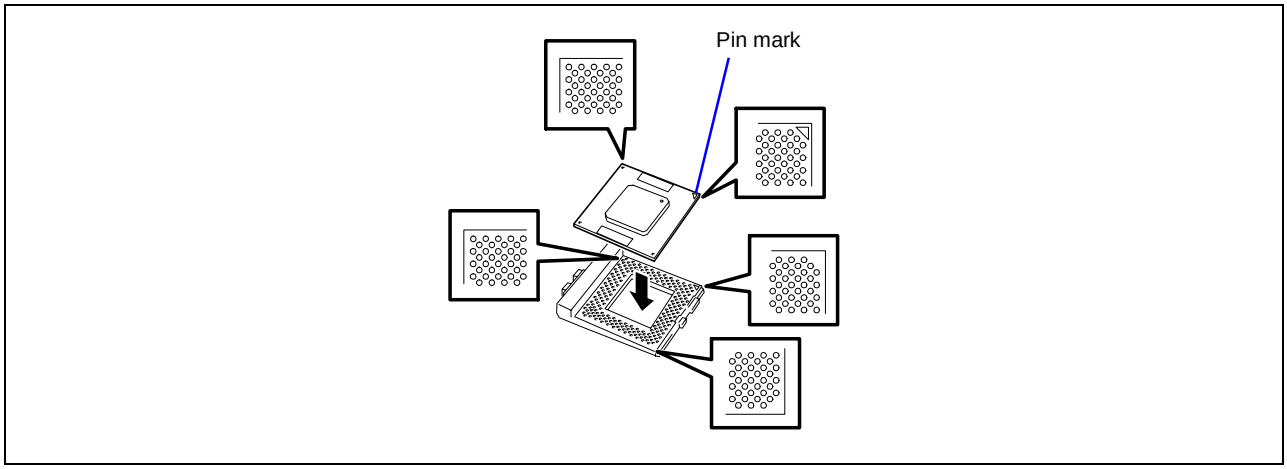
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Open the top cover.
4. Remove the terminator by lifting the lever on the socket.

IMPORTANT: Save the removed terminator for future use.

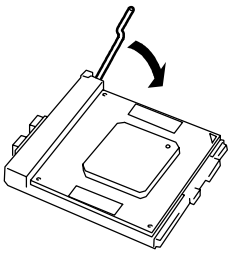


5. Insert the CPU slowly and gently into the socket.

IMPORTANT: Be aware of CPU direction. Pin layouts on two corners among four differ from others to prevent an incorrect insertion. Confirm the pin mark and pin layout on the socket, and insert the CPU correctly.

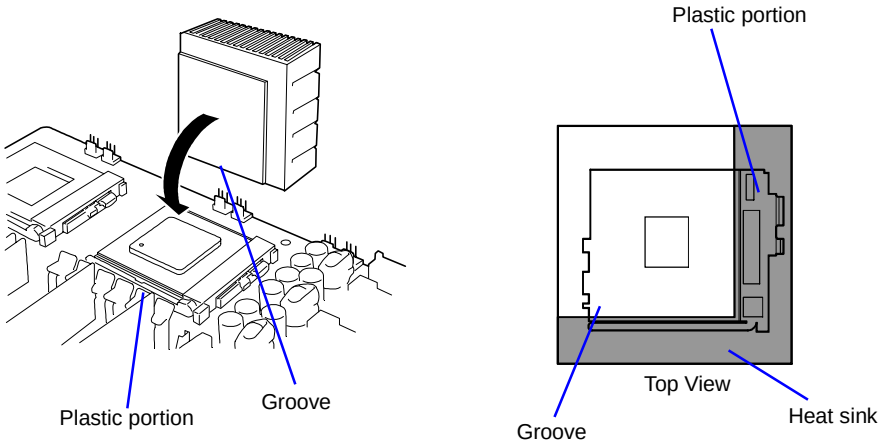


6. Once the CPU is inserted into the CPU socket, push down the lever to secure the CPU.

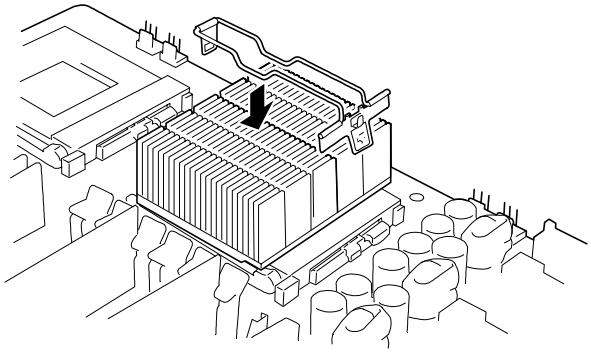


7. Install the heat sink on to the CPU.

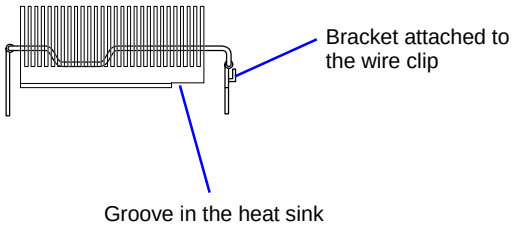
> **NOTE:** When installing the heat sink, be aware its position over the processor and socket. The bottom of the heat sink has an L-shaped groove. Position the heat sink so that the groove clears the lever and plastic part of the socket. See the figure below.



The wire clip is already installed on the heat sink at purchase. If it comes off, install it as shown in the figure below.

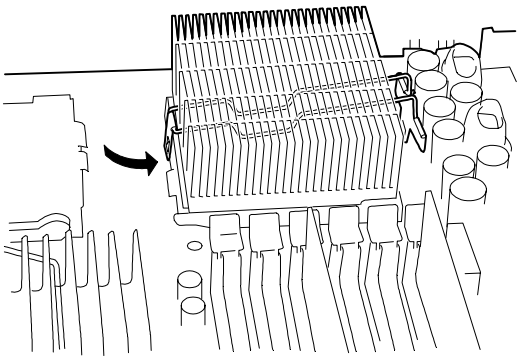


NOTE: Make sure of the orientation of the wire clip.

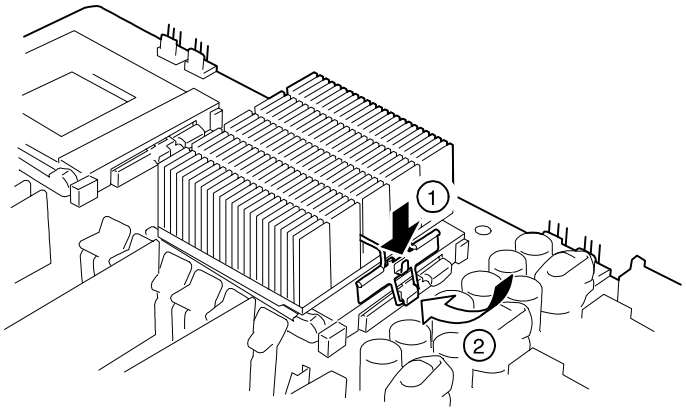


8. Engage the wire clip with the socket.

The bracket-attached side must be engaged with the rear of the socket.



9. Insert a standard screwdriver into the bracket of the wire clip, and engage the wire clip with the socket.



10. Make sure that the heat sink is level.

NOTES:

- If the heat sink is not level, remove it, and then install it again. The following probably causes the heat sink not to be level:
  - The heat sink is not positioned correctly.
  - The wire clip is not engaged correctly.
- Do not move the secured heat sink.

11. Install the components you removed previously.

12. Power on the server, start the SETUP utility, and select [Main] → [Processor Settings] → [Processor Retest] → [Enabled].

13. Insert the EXPRESSBUILDER CD into the CD-ROM drive, and start the system booting from the EXPRESSBUILDER CD.

See the EXPRESSBUILDER User's Guide, located on the EXPRESSBUILDER CDROM, for details.

14. Diagnose the system.

See the EXPRESSBUILDER User's Guide, located on the EXPRESSBUILDER CDROM, for details.

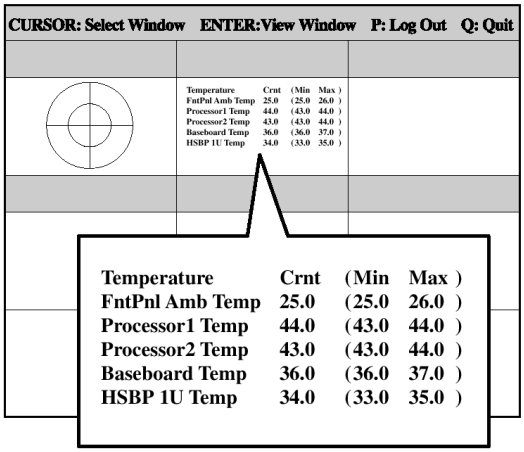
15. Verify the temperature indication (Crnt column) displayed on the diagnostic window.

If the indication is either of the following, it is assumed that the heat sink is incorrectly attached. If no abnormality is shown in temperature indication, you can resume the diagnostics. After the diagnostics is complete, power off the server.

– Processor 2 Temp is higher than Ambient Temp by 30°C or more

– Processor 2 Temp is higher than CPU1 Temp by 10°C or more

If the indication is either of the above, repeat steps 7 and subsequent steps.


CURSOR: Select Window ENTER:View Window P: Log Out Q: Quit
Temperature Crnt (Min Max)
FntPnl Amb Temp 25.0 (25.0 26.0)
Processor1 Temp 44.0 (43.0 44.0)
Processor2 Temp 43.0 (43.0 44.0)
Baseboard Temp 36.0 (36.0 37.0)
HSBP 1U Temp 34.0 (33.0 35.0)
Temperature Crnt (Min Max)
FntPnl Amb Temp 25.0 (25.0 26.0)
Processor1 Temp 44.0 (43.0 44.0)
Processor2 Temp 43.0 (43.0 44.0)
Baseboard Temp 36.0 (36.0 37.0)
HSBP 1U Temp 34.0 (33.0 35.0)

16. Verify that POST displays no error messages.

If POST displays an error message, note the message and see the POST error messages listed in Chapter 6.

17. Select [Main] → [Processor Settings] → [Processor Retest] → [Enabled].

This setting is required to change the hardware configuration data. See Chapter 3 for details.

18. To add one or more CPUs to the server in 1-CPU configuration to operate the server with more than one CPU, do the procedure below:

For Windows 2000, change the driver of [Computer] in the device manager to [ACPI multi-processor PC] and then update the system (see Chapter 4).

For Windows NT 4.0, update the system (see Chapter 4).

For NetWare, update the modules required referring to the manual of NetWare.

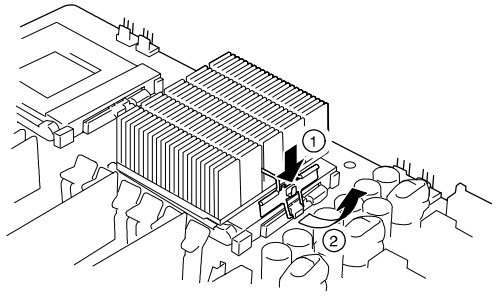
Removing a CPU

Perform the following steps to remove a CPU. The EXPRESSBUILDER CD provided with the server is required for confirming that the additionally installed CPU is in normal state.

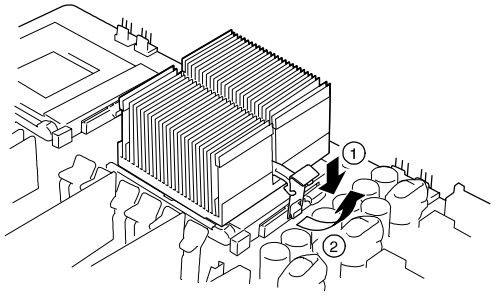
IMPORTANT:

- Do not remove any CPU unless it is failed.
- Install a terminator on any slot in which a CPU is not installed.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Open the top cover.
4. Remove the heat sink.

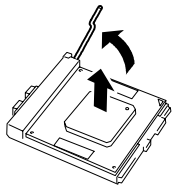


With the optional CPU
(Insert a flat-tip screwdriver into the wire clip, and remove the heat sink.)



With the standard CPU
(Push the clip with your finger to remove the bracket.)

5. Lift the CPU socket lever to the up position (see figure below).



6. When you replace the CPU, install the CPU according to the steps in the previously described installation procedure.

   When you remove the CPU and do not replace it with new one, install a CPU in CPU slot #1, and install a terminator in CPU slot #2.

7. Reinstall all parts removed.
8. Power on the server and start SETUP to select menus [Main] → [Processor Settings] → [Processor Retest] → [Enabled] (see Chapter 3).
9. Execute the system diagnostic program and verify its result as described in installation procedure.
10. Verify that POST displays no error messages.

    If POST displays an error message, take note of the message and see the POST error messages listed in Chapter 6.
11. Start SETUP and select [Main] → [Processor Settings] → [Processor Retest] → [Enabled] to clear error information of removed CPU (see Chapter 3).

    When you replaced a CPU, select [Main] → [Processor Setting] to verify that the ID and L2Cache of the additional CPU are defined normally (see Chapter 3).
12. Select "Yes" for [Main] → [Processor Settings] → [Processor Retest].

    This setting is required to change the hardware configuration data. See Chapter 3 for details.

PCI Board

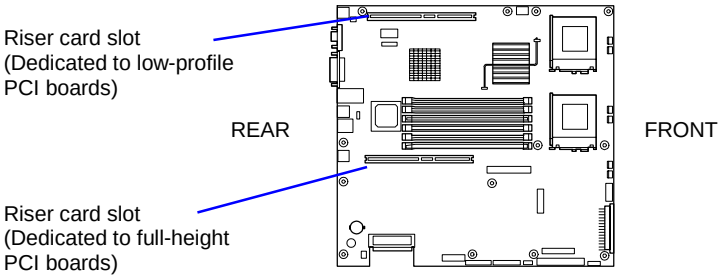
The server has two "riser cards" on the system board that enables installation of PCI boards. Three PCI boards can be installed on each riser card. (Up to six PCI boards can be installed in total.)

Insert PCI boards for network extension and file device function extension into PCI board slots in each riser card.

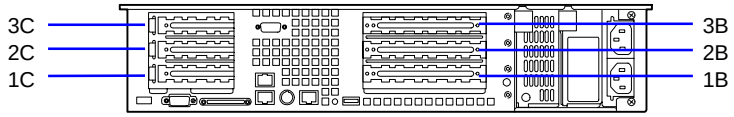
IMPORTANT:

- The PCI board is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the PCI board. Do not touch the PCI board terminals or on-board parts by a bare hand or place the PCI board directly on the desk. For static notes, see the section "Anti-static Measures".
- Some restrictions are imposed on the combination of PCI boards which can be installed in the server. Contact your sales agent for details.
- A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.

NOTE: Some PCI boards use an on-board expanded ROM. See the manual provided with the PCI board to determine whether expanded ROM needs to be loaded. Use the BIOS setup utility "SETUP" for the setting. For details, see Chapter 3.



System board



Rear view of the server

Notes

Observe the following notes on installing/removing a PCI board:

- Do not touch the terminals of the riser cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.
- If the AcceleRAID 160 disk array controller is installed on the riser card of the low-profile type, the internal hard disk drives cannot be used in a disk array configuration. (Attach the provided bracket to the disk array controller, and install the controller on the riser card of the full-length/full-height type.)
- If a PCI board is installed in a slot lower than the one containing the N8103-52F disk array controller, the LED relay cable provided with the server cannot be used to connect the LED connector on the disk array controller board and the DAC LED connector on the system board. (The disk access lamps on the front of the server cannot indicate the status of access to the hard disk drives connected with the disk array controller.)
- The PCI bus slot search order at start of the server is defined as follows:

  – Low-profile riser card, and then the full-height riser card

  – Ascending order of the slot numbers

  Thus, the system searches for the slot numbers in the following order:

  1C → 2C → 3C → 1B → 2B → 3B

  A SCSI controller (including a disk array controller) with the system disk connected must be searched for before any other SCSI controllers. Determine the slot in which the SCSI controller is first searched for. The system is unable to start if the SCSI controller search order is wrong.
- Set "Disabled" for the optional ROM of a LAN device not to be booted by using the BIOS setup utility.
- If an additional LAN device is installed in slot 3C or 3B, it is hard to push the catch of the connector with your finger that is connected to the LAN port. Disconnect the connector pushing the catch with a standard screwdriver. At this time, be very careful for the screwdriver not to damage the LAN port or other ports.
- If a bootable PCI board (e.g., a disk array controller, SCSI controller, or LAN card) is additionally installed, the boot priority is changed to the default. After the additional installation, start the BIOS setup utility, select [Boot] → [Boot Device Priority], and set the new boot priority.
- If a disk array controller is installed on both the low-profile riser card and the full-height riser card, the system is unable to start through a disk which is connected to the disk array controller installed on the full-height riser card.
- The SCSI controller installed on the low-profile riser card cannot be connected to a device additionally installed in the internal backup device bay.

- If an option operating with only 33 MHz is installed in one of the slots (1C, 2C, and 3C, or 1B, 2B, and 3B) on a PCI riser card, the options installed in the other slots of the same riser card are subjected to operation with only 33 MHz.

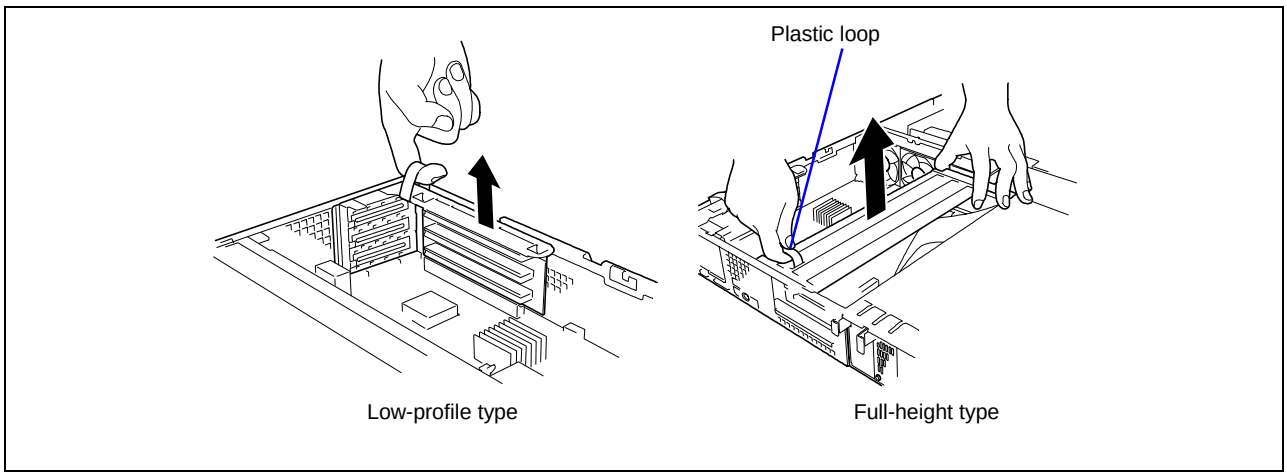
Installing a PCI Board

Perform the following steps to install a PCI board on the riser card:

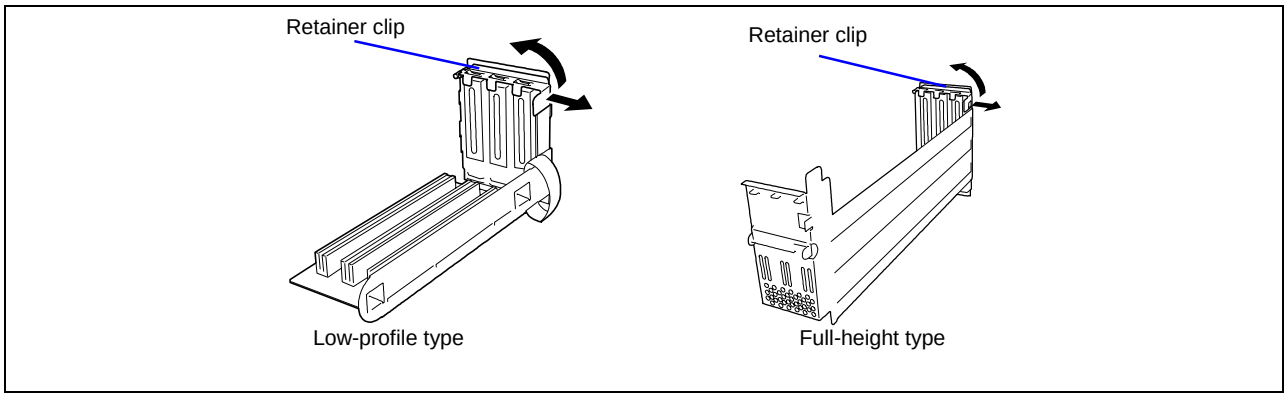
IMPORTANT:

- Each riser card supports low-profile or full-height PCI boards. Before installing a PCI board, confirm that the type of the PCI board.
- When installing a PCI board, confirm that the card connector matches the connector of the riser card.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Remove the top cover.
4. Lift straight up and remove the riser card from the server.

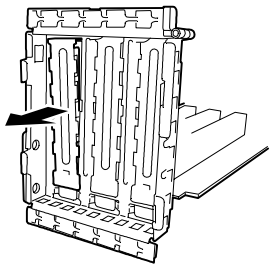


5. Unlock and open the retainer clip.



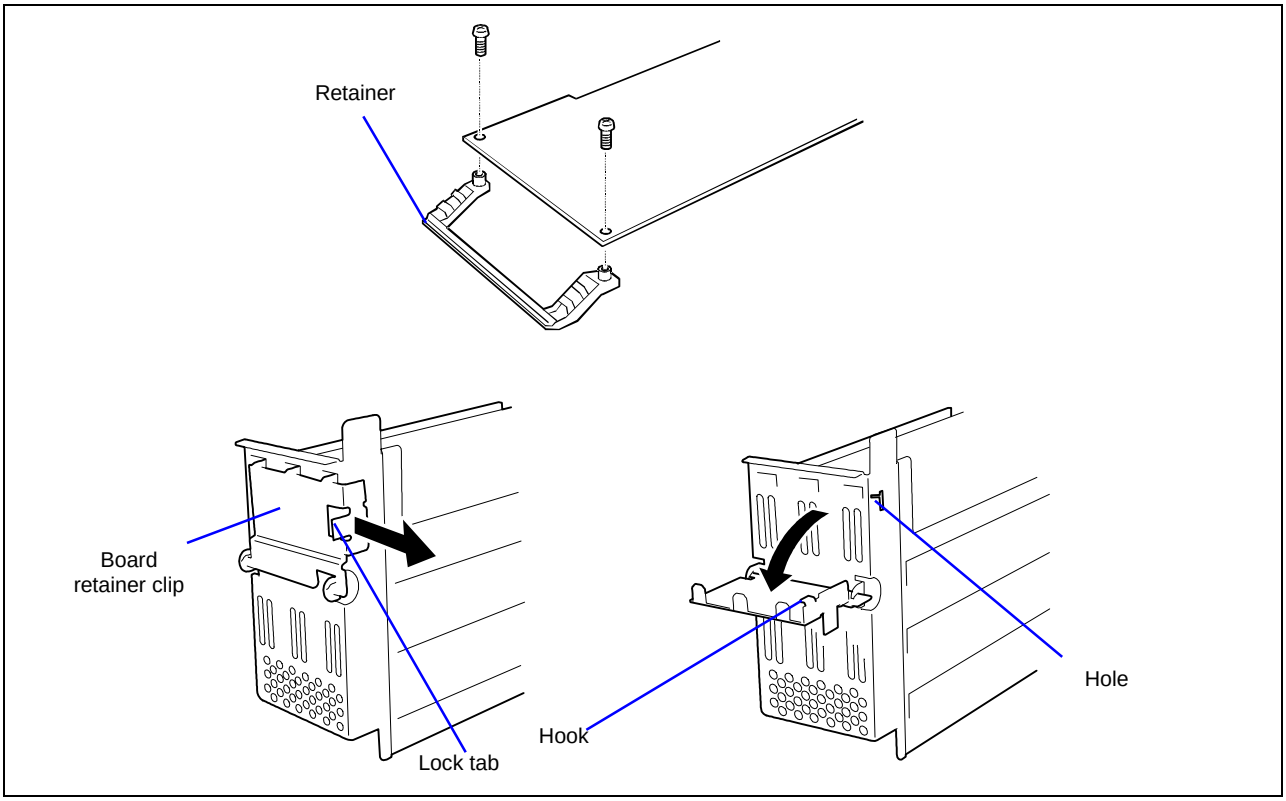
6. Remove the extension slot cover.

NOTE: Keep the removed extension slot cover for future use.



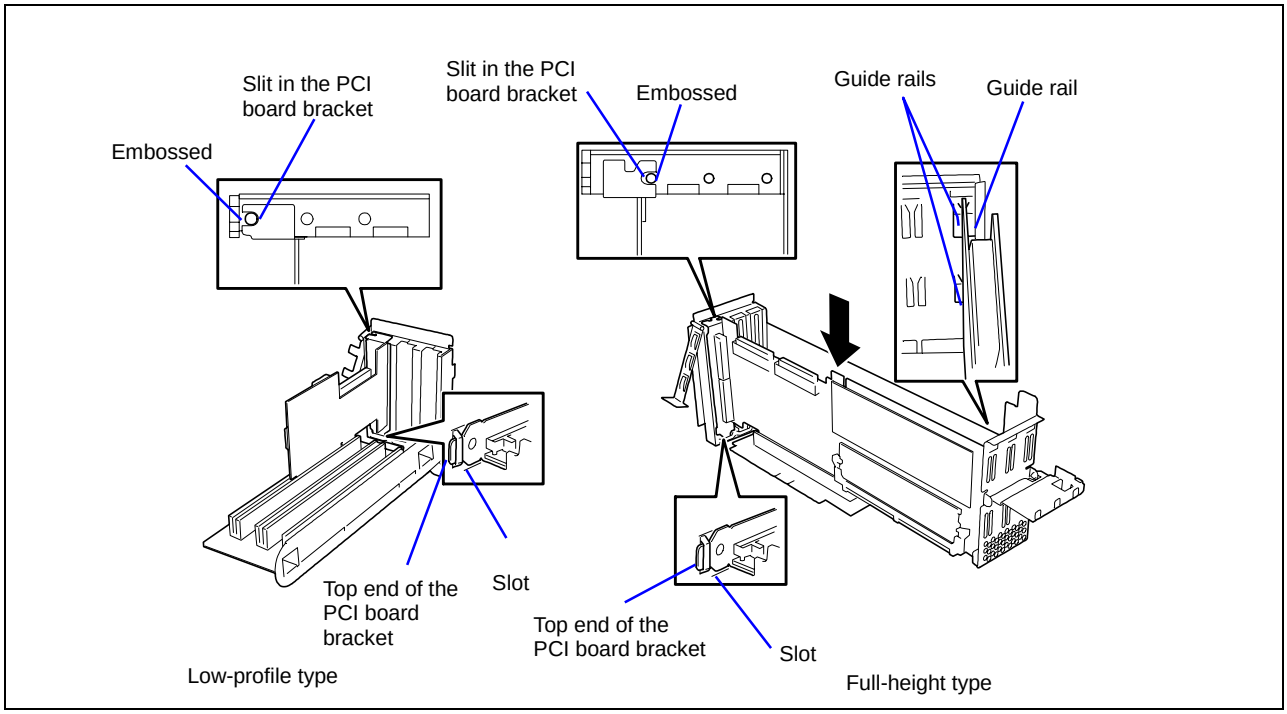
7. This step is required only for a PCI board of the full-height/full-length type.

Before installing a PCI board of the full-height/full-length type, remove the retainer from the PCI board, and then unlock and open the card retainer clip on the other side of the guide rail.



8. Install the PCI board on the riser card.

Align the PCI board terminal section with the riser card slot, and firmly push the PCI board until it is fully seated.



IMPORTANT:

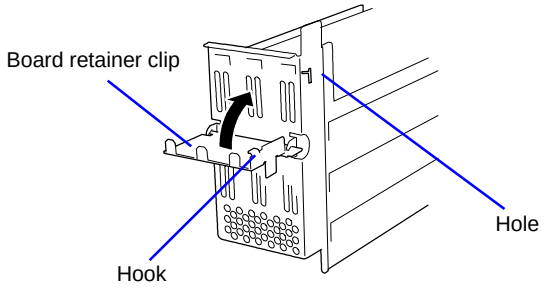
- Do not touch the terminals of the riser cards and PCI boards with your bare hand. Fingerprints and dust left on them cause the server to malfunction.
- If you are unable to install a PCI board correctly, remove it, and then install it again. Be careful not to apply excess force to a PCI board or riser card. Doing so may damage the card.

NOTES:

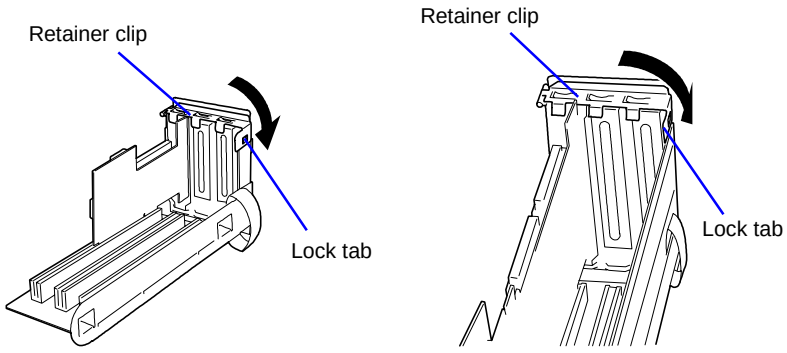
- Confirm that the slit in the PCI board bracket is positioned by the embossed part. (This applies to other card brackets and extension slot covers.)
- Confirm that the top end of the PCI board bracket is inserted in the designated slot of the riser card.
- If a full-height PCI board is installed, confirm that the PCI board bracket and the edge of the opposite card are inserted in the guide rails of the riser card.

9. This step is required only for a PCI board of the full-height/full-length type.

Close the card retainer clip to lock the card.



10. Close the retainer clip to lock the card.

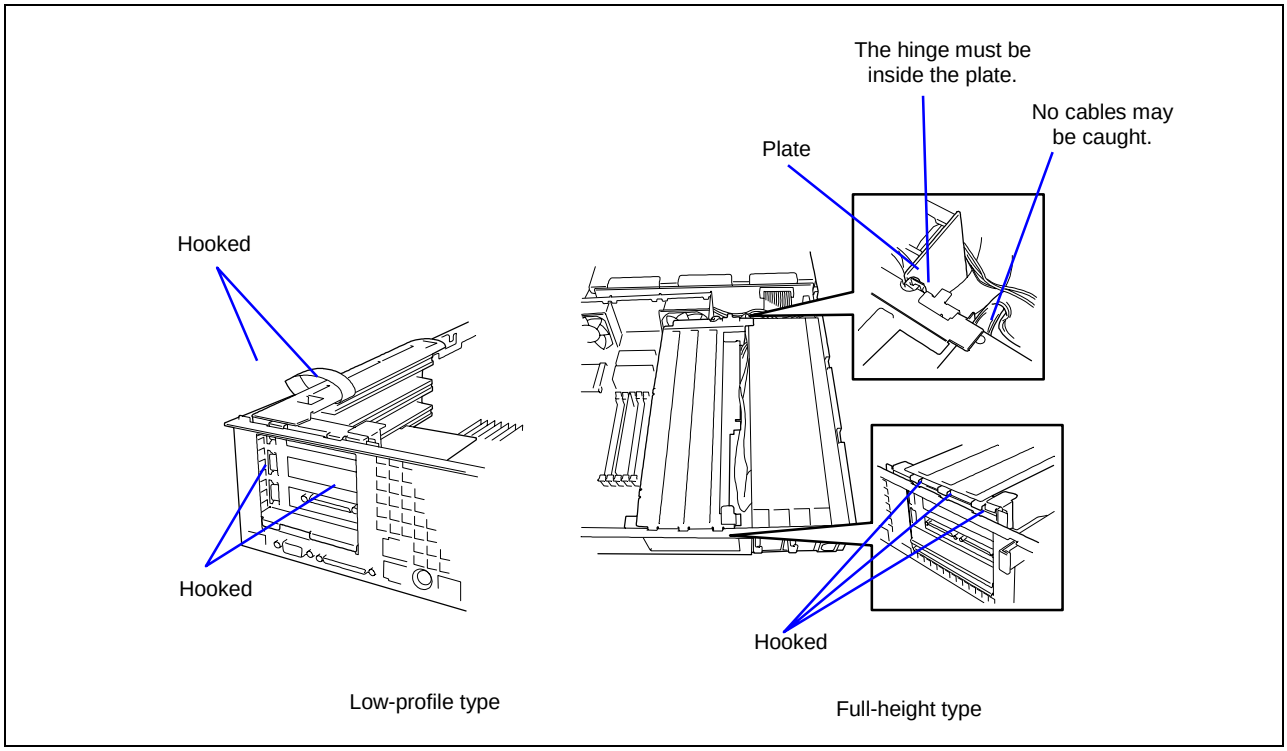


11. Insert the riser card into the slot on the system board.

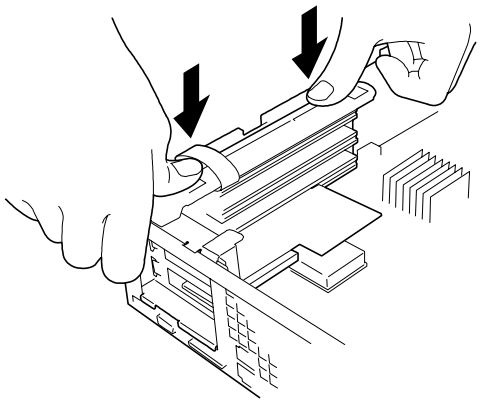
Align the riser card terminal section with the slot on the system board, and firmly push the riser card until it is fully seated.

NOTES:

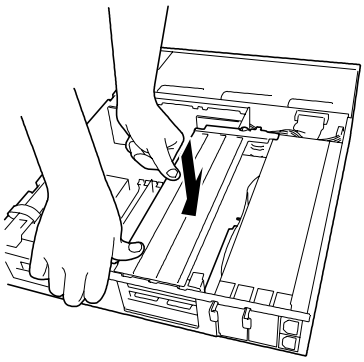
- There are catches on the riser card frame that are used to secure the riser card to the cabinet. When inserting the riser card, confirm that the catches are correctly fit into the holes on the rear of the cabinet. After the insertion, push the riser card with your fingers until you cannot see any part of the riser card terminal section. The riser card is now fully seated in the slot.
- Confirm that any cable in the system is not caught in the riser card.



12. After the insertion, push the riser card with your fingers until it is fully seated.



Low-profile type



Full-height type

13. Install the components you removed previously.

14. Verify that POST displays no error messages.

If POST displays an error message, take note of the message and see the POST error messages listed in Chapter 6.

15. Select "Yes" for [Advanced] → [Reset Config Data].

This setting is required to change the hardware configuration data. See Chapter 3 for details.

16. Start the BIOS configuration utility in the installed card, and set up the card.

Presence/absence of the utility and the start and operation methods depend on the card. For details, see the manual provided with the card. If a PCI board (e.g., a disk array controller, SCSI controller, or LAN card) with a bootable device connected is additionally installed, the boot priority is changed to the default. After the additional installation, start the BIOS setup utility, select [Boot] → [Boot Device Priority], and set the new boot priority. (See Chapter 3.)

Removing a PCI Board

Remove a PCI board in reverse order of the installation steps. After the removal, start the BIOS setup utility, select [Boot] → [Boot Device Priority], and set the new boot priority. (See Chapter 3.)

Disk Array Controller Board

The disk array controller board is an optional PCI board provided to improve data reliability.

Installing the disk array controller board allows you to use hard disks in the device bays of the server and those in the optional expansion disk cabinet in the disk array configuration.

IMPORTANT:

- The disk array controller board is extremely sensitive to static electricity. Make sure to touch the metal frame of the Server to discharge static electricity from your body before handling the disk array controller board. Do not touch the disk array controller board terminals or on-board parts by a bare hand or place the disk array controller board directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
- Making hard disks in the disk array configuration or changing the RAID level initializes hard disks. If the hard disk to be configured in the array has your valuable data stored, make sure to make a backup copy of the data in another hard disk before installing the disk array controller board and configuring the array.
- The disk array configuration requires at least two hard disks.
- Use hard disks of the same capacity and performance (e.g., revolution) for each pack to configure them in the array.
- If using Netware, you cannot use a disk array controller of the full-height type in slot 1B, 2B, or 3B and a disk array controller of the low-profile type in slot 1C, 2C, or 3C at the same time. To use more than one disk array controller, install them in only either slots 1B, 2B, and 3B or slots 1C, 2C, and 3C. (Up to 3 disk array controller boards can be installed.)

NOTES:

- Before installing a disk array controller board, start the SETUP utility, select [Advanced] → [PCI Configuration], and confirm that [Enabled] is set for the parameter [PCI Slot xx ROM] (xx: PCI slot number).
- A disk array configuration of RAID1, RAID5, or RAID0+1 increases disk reliability. However, the actually available capacity becomes smaller than the total hard disk capacity in the disk array configuration.

Installing a Disk Array Controller Board

See "PCI Board" for the installation of a disk array controller.

IMPORTANT:

- A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.
- If the AcceleRAID 160 disk array controller is installed on the riser card of the low-profile type, the internal hard disk drives cannot be used in a disk array configuration. (Attach the provided bracket to the disk array controller, and install the controller on the riser card of the full-height type.)
- If a PCI board is installed in a slot lower than the one containing the AcceleRAID 160 disk array controller, the LED connector on the disk array controller board cannot be connected to the DAC LED connector on the system board. (The disk access lamps on the front of the server cannot indicate the status of access to the hard disk drives connected with the disk array controller.)
- The PCI bus slot search order at start of the server is defined as follows:
  – Low-profile riser card, and then the full-height riser card
  – Ascending order of the slot numbers
  Thus, the system searches for the slot numbers in the following order:
  1C → 2C → 3C → 1B → 2B → 3B
  A SCSI controller (including a disk array controller) with the system disk connected must be searched for before any other SCSI controllers. Determine the slot in which the SCSI controller is first searched for. The system is unable to start if the SCSI controller search order is wrong.
- To switch the internal hard disk drives into a disk array configuration by connecting a disk array controller to the full-height riser card, connect the cable before installing the riser card on the system board.
- If a disk array controller is installed on both the low-profile riser card and the full-height riser card, the system is unable to start through a disk that is connected to the disk array controller installed on the full-height riser card.
- When connecting a disk array controller, start the BIOS SETUP utility, select [Boot] → [Hard Disk Drives], and set the 8th priority or earlier for the controller. If the 9th priority or later is set, the system is unable to start the disk array controller configuration menu.

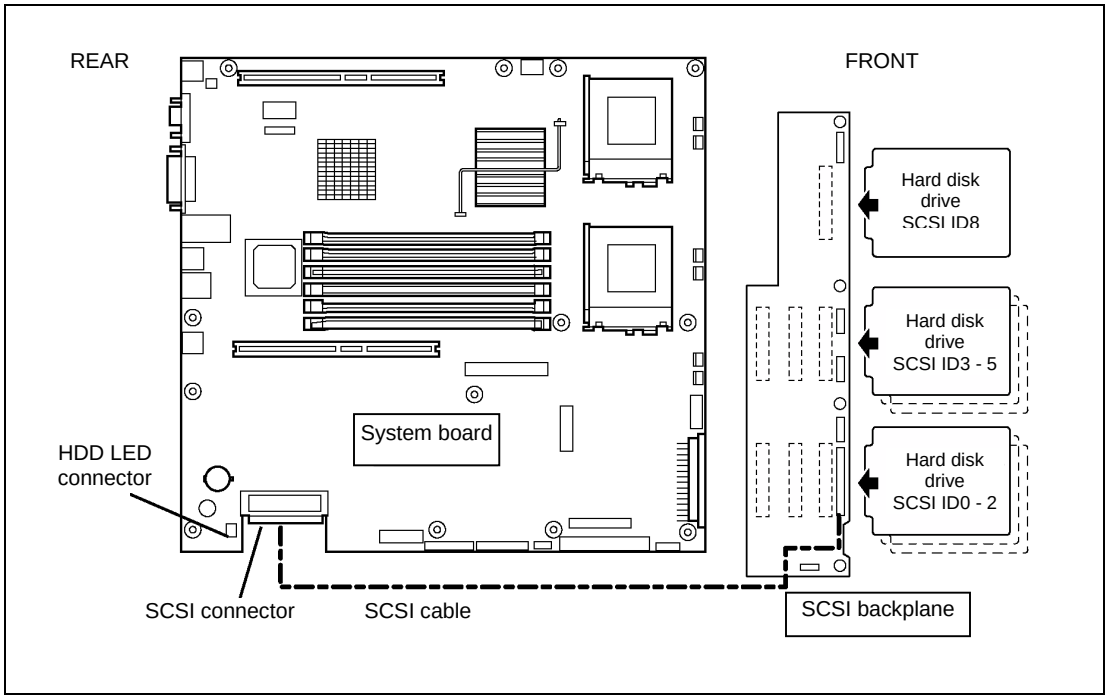
Removing a Disk Array Controller Board

Remove a disk array controller board in reverse order of the installation steps.

Use of internal hard disk drives in a disk array configuration

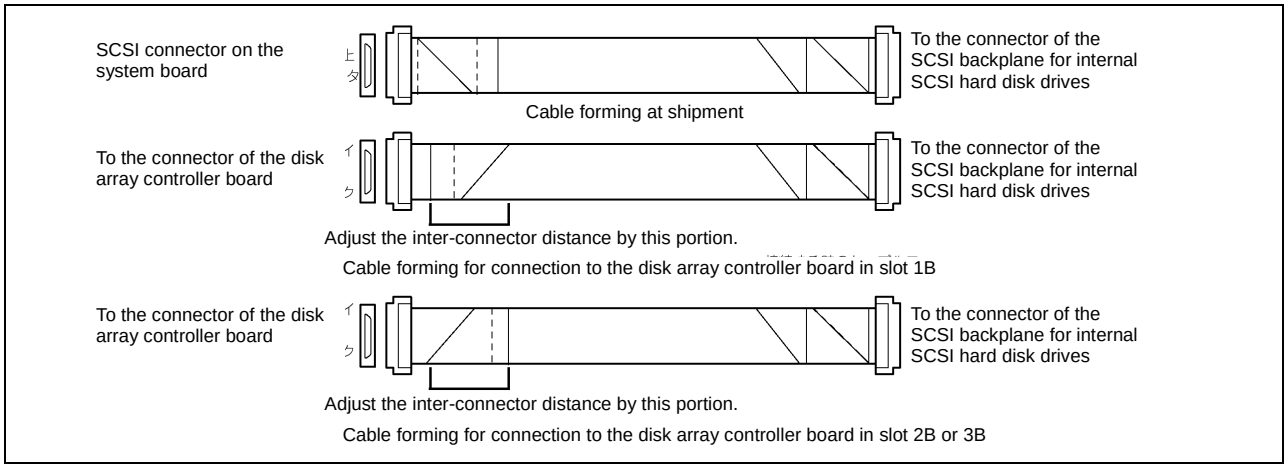
To use the internal hard disk drives in a disk array configuration in the server containing a disk array controller board, reconnect the SCSI cables and LED cables on the system board.

The internal hard disk drive interface is connected to the SCSI connector on the system board at shipment.



- Forming of the SCSI cable

  To connect a disk array controller, use the SCSI cable connected to the system board. In this case, the SCSI cable needs to be formed. The following shows the cable forming at shipment and how to form the SCSI cable when it is connected to the disk array controller. (The solid lines indicate lines for valley fold, and the broken lines indicate lines for mountain fold.)

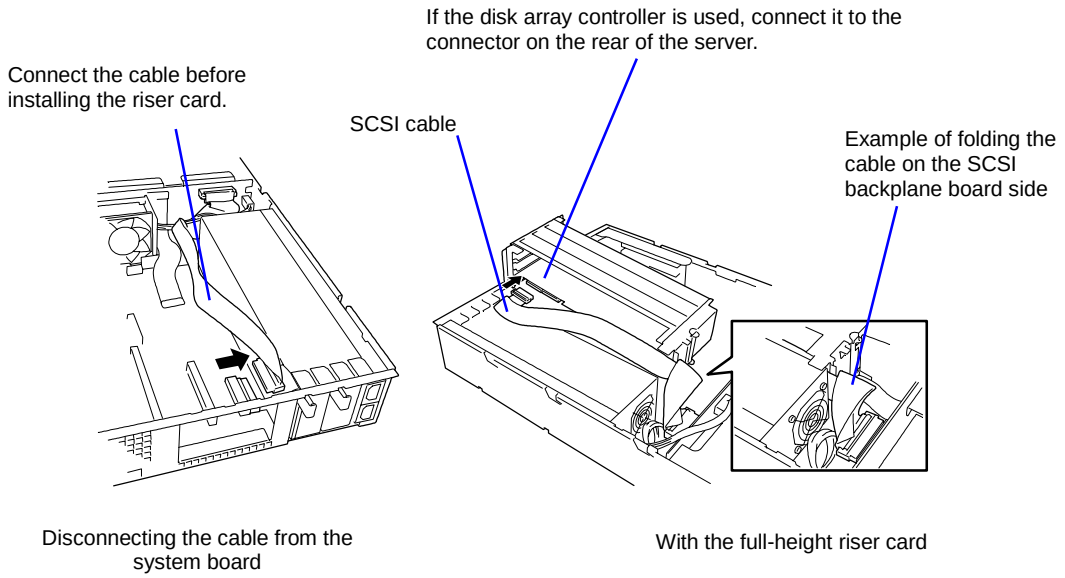

SCSI connector on the system board
To the connector of the SCSI backplane for internal SCSI hard disk drives
Cable forming at shipment
To the connector of the disk array controller board
To the connector of the SCSI backplane for internal SCSI hard disk drives
Adjust the inter-connector distance by this portion.
Cable forming for connection to the disk array controller board in slot 1B
To the connector of the disk array controller board
To the connector of the SCSI backplane for internal SCSI hard disk drives
Adjust the inter-connector distance by this portion.
Cable forming for connection to the disk array controller board in slot 2B or 3B

- SCSI cable connection

  To use the internal hard disk drives in a disk array configuration, disconnect the SCSI cable from the SCSI connector on the system board, and connect it to the connector of the disk array controller board.

IMPORTANT:

- To switch the internal hard disk drives into a disk array configuration by connecting a disk array controller to the full-height riser card, connect the cable before installing the riser card on the system board.
- Some disk array controller boards have more than one channel (connector). They may have connectors for internal connection and external connection. However, the connectors may be under exclusive specification in consideration of the internal connection of the disk array controller board. Make sure that each connector (channel) is for internal connection or external connection. For the connectors and channels, see the manual provided with the disk array controller board.

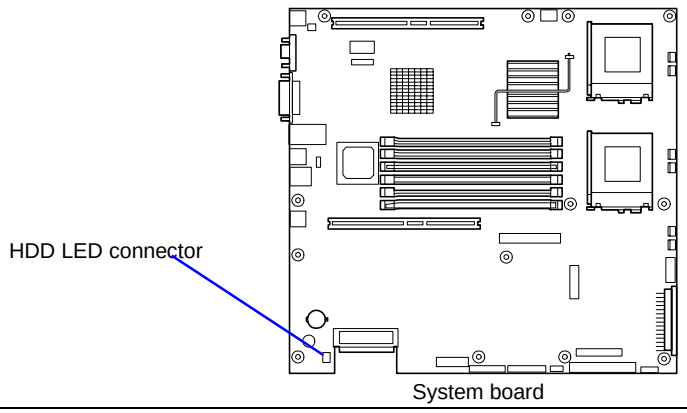

If the disk array controller is used, connect it to the connector on the rear of the server.
Connect the cable before installing the riser card.
SCSI cable
Example of folding the cable on the SCSI backplane board side
Disconnecting the cable from the system board
With the full-height riser card

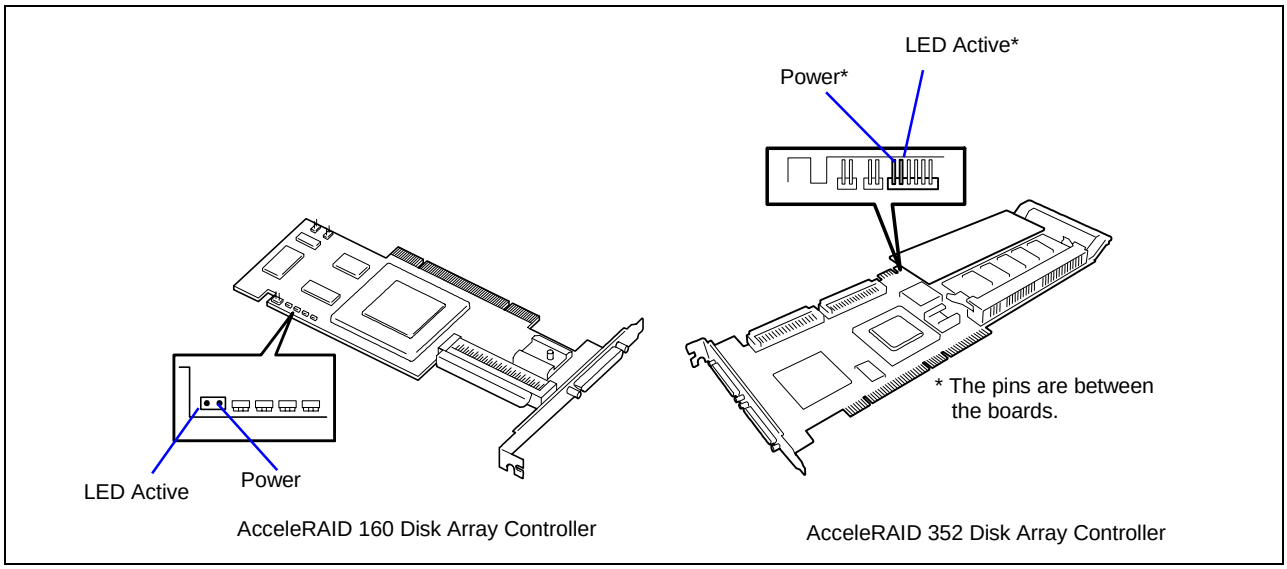
- LED relay cable connection

  To indicate the status of access to the internal hard disk drives in a disk array configuration, connect the provided LED relay cable to the HDD LED connector on the system board and to the HDD LED connector of the disk array controller. The LED relay cable is located in the accessory box.

  NOTE: The LED relay cable is free from polarities. An end of the cable can be connected to either of the HDD LED connectors.

  IMPORTANT: If a card is installed in a slot lower than the one containing the AcceleRAID 160 disk array controller, cable LED relay cable connection is not permitted. This is to prevent the cable connector from touching the card in the lower slot.





- Disk array configuration of internal hard disk drives

  Observe the following notes on configuring a disk array:

  – The server must contain more than one SCSI hard disk drive having the same capacity and the same rotational speed. (The minimum number of required disks depends on the configuration of RAID (Redundant Arrays of Inexpensive [Independent] Disks).)

  – Select/set a RAID level "RAID0", "RAID1", "RAID5", or "RAID0+1" of disk array configuration.

  When installing a system in an internal hard disk, you should use "Express Setup" to perform all the procedures for RAID configuration, OS installation, and then OS setup.

  Use Express Setup even when not installing a system. Start Express Setup, select [OS Selection] → [Others]. The installer automatically performs all the procedures for RAID configuration, maintenance partition setting, and then maintenance utility installation.

  When making the setup in manual mode, use the RAID configuration utility in the chip on the board. You can start the utility during execution of POST that automatically starts immediately after you turn on the server power switch. For details, see the online document in the EXPRESSBUILDER CD provided with the server. (The utility varies depending on the disk array controller board.) For details on the data transfer rate, RAID, and array configuration, see the manual provided with the disk array controller board as well as the online document.

Disk Expansion Unit (DEU) in a Disk Array Configuration

A disk expansion unit is an exclusive device that can add up to 14 hard disk drives to your server. (The number of hard disk drives depends on the DEU model.) The server containing a disk array controller board can connect to one or two DEUs. For details on the number of devices connected, see the manuals provided with the disk array controller and disk expansion unit.

> **IMPORTANT:** A disk expansion unit is provided with no hard disk drives. You need to purchase hard disk drives separately.

After connecting the disk expansion unit, use the RAID configuration utility in the chip on the board to set the disk expansion unit in a disk array configuration (RAID0, RAID1, RAID5, or RAID0+1). (The utility varies depending on the board.) For details on settings and the setting methods, see the online document in the EXPRESSBUILDER CD provided with the server or the manual provided with the board.

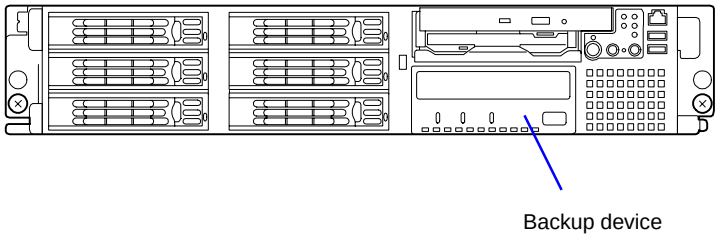
While a disk expansion unit is set in a disk array configuration, you can use the "Auto Rebuild" feature of the disk array controller to restore data damaged if one of the hard disk drives installed in the disk expansion unit fails. (Replace the failing hard disk drive while the power is on. (Hot swapping))

Backup Device

The server has one slot for installing a backup device such as a magnetic tape drive.

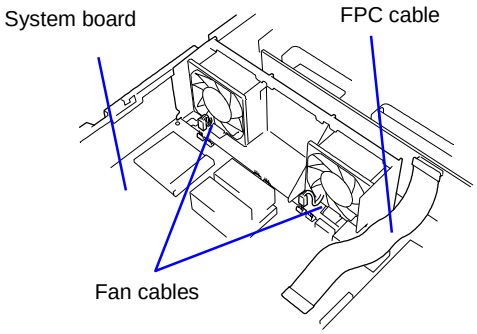
IMPORTANT:

- A SCSI controller board (option) is necessary for installing a backup device. If an internal hard disk drive is connected to a disk array controller, a backup device can be connected to the SCSI connector on the system board.
- Set "OFF" for the terminating resistor of the backup device you are going to install, and set a SCSI ID different from those of other devices. For the settings, see the manual provided with the server.
- Install only a backup device specified by NEC.
- The size of a backup device which can be installed in this server is as follows:
  Width: Up to about 9 cm (3.5 inches)
  Height: Up to about 4 cm (1.6 inches)



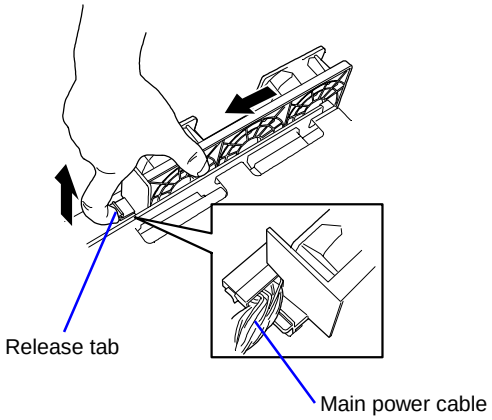
Installing a Backup Device

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Open the top cover.
4. Remove the riser card for full-height PCI boards.
5. Disconnect the two fan cables from the fan unit.
6. Disconnect the FPC cable connecting the system board and SCSI backplane.



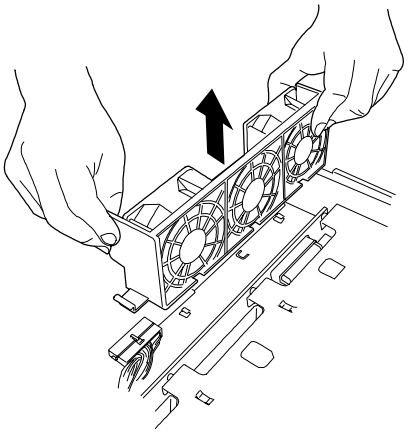
IMPORTANT: Be careful not to damage the FPC cable.

7. While lifting up the release tab of the fan unit, slide the fan unit to the left when viewed from the front of the server.

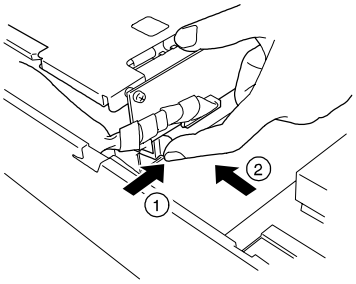


IMPORTANT: Be careful not to damage the main power cable or the flat cable and components in the server.

8. Lift straight up and remove the fan unit from the server.

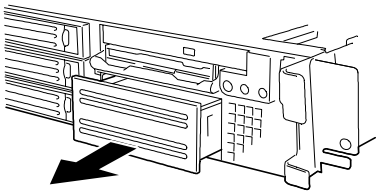


9. While pushing the latching tab that secures the device bay, push the device carrier out of the front of the server.

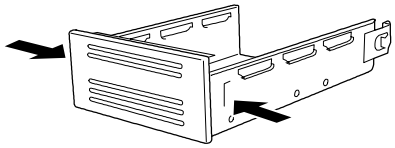


IMPORTANT: Be careful not to bend the latching tab by applying excess force. If the tab bends, straighten it out as it was.

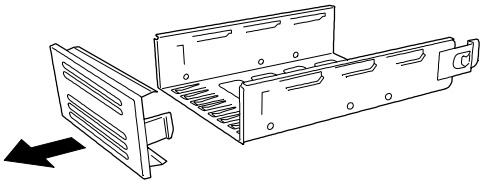
10. Remove the device carrier from the front of the server.



11. Push the tabs at both ends of the front panel.

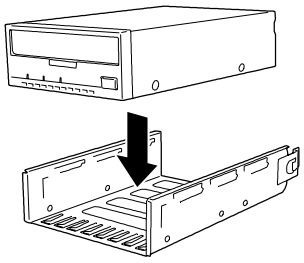


12. Remove the front panel.

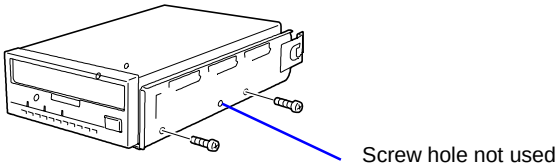


IMPORTANT: Keep the removed front panel for future use.

13. Place the backup device on the device carrier.



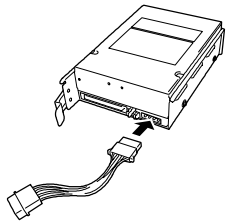
14. Secure the backup device with the provided screws.
Tighten two screws on each side.



NOTES:

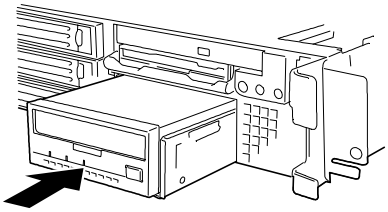
- Be sure to use the screws provided with the backup device.
- Position the backup device so that the device screw holes align with the screw holes in the device carrier.

15. Connect the provided power extension cable to the power connector of the device.



16. Insert the device carrier into the backup device bay.

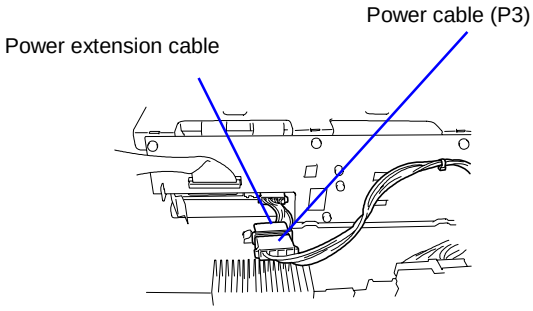
Push the device carrier as far as it will go. It is locked when a "click" is heard.



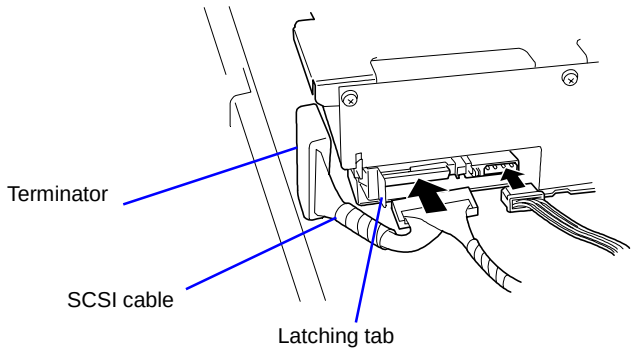
NOTE: Be careful not to catch the connected power extension cable in inserting the device carrier.

17. Connect the SCSI cable and power cable (connector P3) to the device.

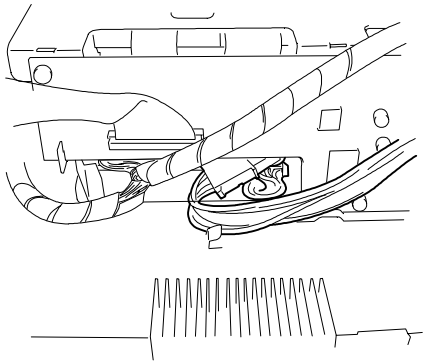
Use the SCSI cable provided with this server. Connect the other end of the SCSI cable to the SCSI connector on the SCSI controller board or the system board (if no cable is connected there).



NOTE: Confirm where to place the terminal at the end of the SCSI cable. The terminator must be placed on the lower part of the front panel board on the device bay side. At this time, also confirm that the SCSI cable is not in contact with the latching tab of the device carrier. This is to prevent the cable from being damaged.

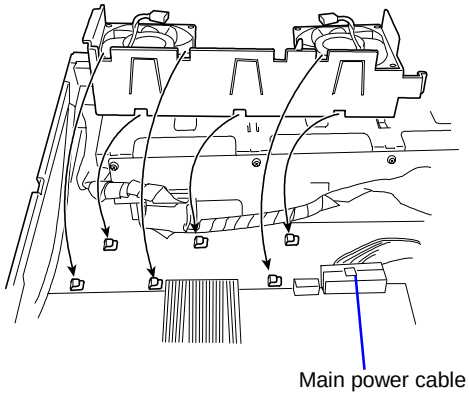


18. If the power extension cable is connected, push it toward the rear of the device bay so that it will not bother your work.



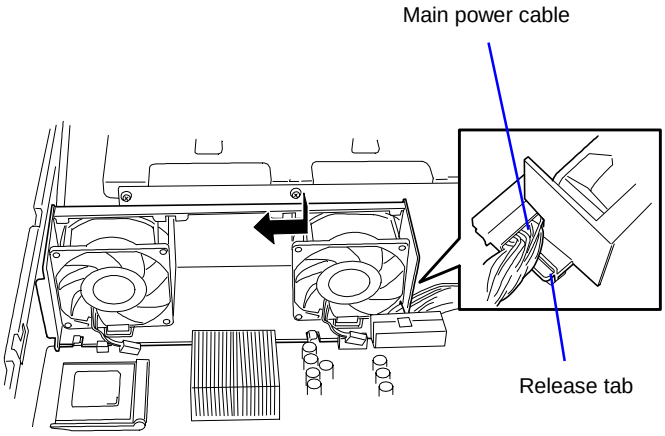
19. Place the fan unit in the server.

The bottom of the fan unit has a slit for the unit to be hooked to the bottom of the server. Align the slit with the hook and place the fan unit.



IMPORTANT: Be careful not to damage the main power cable, power cable, peripheral cables, and components.

20. Slide the fan unit to the right when viewed from the front of the server, and secure it.



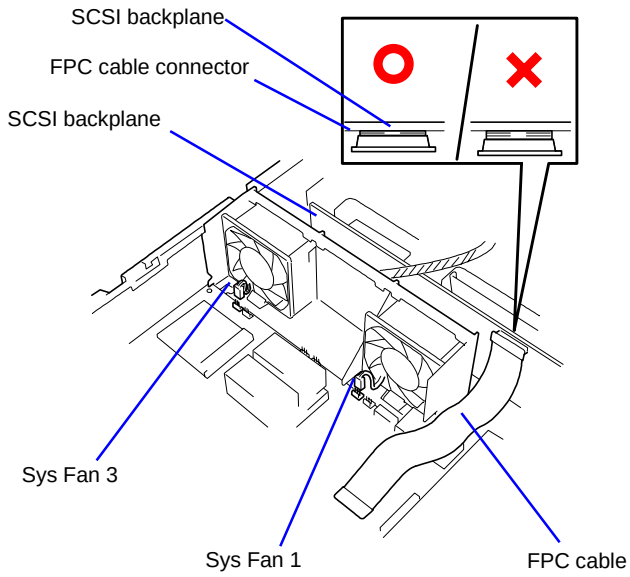
IMPORTANT: Be careful not to damage the main power cable, power cable, peripheral cables, and components.

NOTE: Confirm that the release tab of the fan unit is locked.

21. Connect the two fan cables.

Connect them according to the print on the system board.

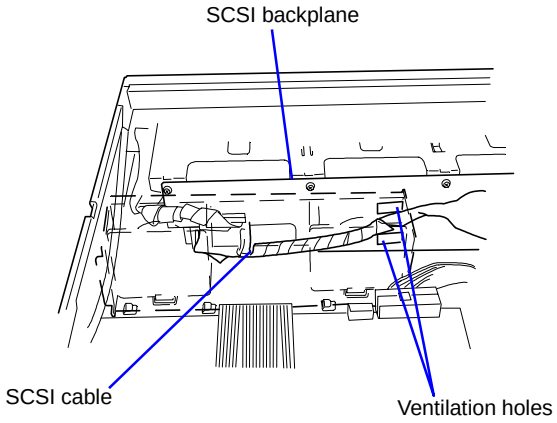
22. Connect the FPC cable.



NOTE: Confirm that the FPC cable is securely connected to the connector on the SCSI backplane and the one on the system board.

23. Route the SCSI cable.

The SCSI backplane has ventilating holes for cooling the hard disk drives. Route the SCSI cable between the ventilating holes so that the cable will not cover the holes.



IMPORTANT: This step is very important for increasing the cooling effect.

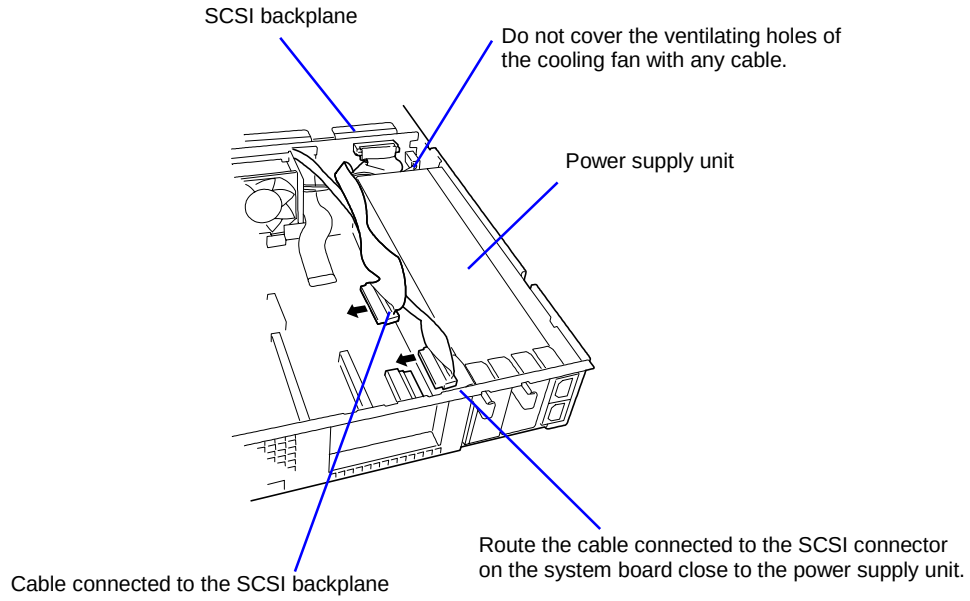
24. Route the SCSI cable and connect it to the connector of the board.

When connecting to the SCSI connector on the system board, route the SCSI cable closer to the power supply unit than the SCSI cable connected to the SCSI backplane.

When connecting the SCSI cable to an optional SCSI controller, route the SCSI cable

connected to the SCSI connector on the system board close to the power supply unit.

NOTE: Confirm that the SCSI cable does not cover the ventilation hole of cooling fan of the power supply unit.


SCSI backplane
Do not cover the ventilating holes of the cooling fan with any cable.
Power supply unit
Route the cable connected to the SCSI connector on the system board close to the power supply unit.
Cable connected to the SCSI backplane

<Example of connecting the SCSI cable of a backup device to the SCSI connector on the system board>

25. Install the components you removed previously.

26. Make the setup according to "SCSI BIOS" in Chapter 3.

Removal

Remove the backup device in reverse order of the installation steps.

Appendix A

Specifications

Item		NEC Express5800/120Rd-2	
CPU	Type	Intel® Pentium® III processor	Intel® Pentium® III processor-S
	Clock/Cache	1.0GHz/256KB	1.26GHz/512KB
	Number of processors	1	
	Maximum	2	
Chipset		Server Works Server Set III HE-SL	
Memory	Standard	256MB	
	Maximum	6GB (The standard DIMM must be replaced.)	
	Expansion unit	2 DIMMs (128MB×2/256MB×2/512MB×2/1024MB×2)	
	Expansion times	2 times	
	Memory module	SDRAM DIMM (Low Profile PC133 Buffered Type)	
	Error check	ECC	
Graphics (VRAM)		ATI RAGE XL (VRAM 8MB)	
Auxiliary input device	Floppy disk (standard)	3.5-inch drive × 1 *1	
	Hard disk (standard)	None	
	Hard disk (maximum)	512.4 GB (73.2 GB × 7)	
	CD-ROM (standard)	ATAPI interface × 1 (Load on tray type, x24 speed) *1	
Additional bay	Hard disk bay	7 slots *2	
	3.5-inch bay	1 slot	
Additional slot	PCI (64-bit)	3 slots	
	Low Profile PCI (64-bit)	3 slots	
LAN interface		100Base-TX/10Base-T (2 ports)	
External interface	Keyboard/mouse	MINI DIN 6-pin connector (1 port)	
	USB	4-pin (4 ports)	
	Serial	2 ports, (D-sub 9-pin (1 port) and RJ-45 (1 port))	
	Network	RJ-45 (2 ports)	
	Display	MINI D-sub 15-pin (1 port)	
	SCSI	Ultra 160 SCSI (1 port)	
Cabinet design		Rack-mount type (2U)	
External dimensions		483 (width) × 88 (height) × 658 (depth) mm	
Weight		27 kg (Max.)	
Power supply		100 to 120 VAC ±10%, 200 to 240 VAC ±10%, 50/60 Hz ±1 Hz	
Power consumption (maximum)		360 VA, 350 W	
Environmental requirements	Temperature	10 to 35°C	
	Humidity	20 to 80% RH (no condensation)	
Others		NEC EXPRESSBUILDER supported, NEC ESMPRO provided in the standard configuration	

*1 Cannot be used if a hard disk drive is installed in Flex bay.
*2 When one slot is used as a hard disk bay

(This page is intentionally left blank.)

Appendix B

Interrupt Requests

The factory-set interrupt requests are listed below. Find an appropriate one to install an optional device.

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	8	Real-time clock
1	Keyboard	9	PCI/SCI
2	Cascaded connection	10	PCI
3	COM2 serial port (PCI)	11	ESMINT/PCI
4	COM1 serial port (PCI)	12	Mouse
5	PCI/LPT2 parallel port	13	Numeric processor
6	Floppy disk	14	Primary IDE (CD-ROM drive)
7	(PCI/LPT1 parallel port)	15	–

(This page is intentionally left blank.)

Appendix C

Installing and Configuring Windows 2000 and Windows NT 4.0

WINDOWS 2000

This appendix contains supplemental instructions needed to install and configure hardware and software used with the Microsoft Windows® 2000 Operating System. This information is intended to supplement the more detailed procedural documents available from Microsoft. This information is not intended to be the central source of installation and configuration information for your system. Read this entire appendix along with Microsoft's Windows® 2000 Setup procedures before starting the installation process.

IMPORTANT: Read the System Release Notes for the latest system information before attempting to install Windows 2000 Operating System on your system.

Device Drivers

The drivers required for the devices listed in the table below are located on the EXPRESSBUILDER CD that is included with your system. To create the required diskettes, select “Tools” on the EXPRESSBUILDER CD menu.

IMPORTANT: When creating the required diskettes from the EXPRESSBUILDER CD make sure you use the drivers required for the devices on your specific system.

Always read the information in the release notes or inserts, included with any options for they supersede the information in this guide.

Supported Device	Required Driver Media*
SCSI RAID Controller	Windows 2000 OEM Diskette*
System Board	Windows 2000 NEC Update Module**

*Diskette generated from the NEC EXPRESSBUILDER CD
**Run this application from the EXPRESSBUILDER CD; diskette not required

Installation Assumption

The installation and configuration instructions in this appendix assume the following:

- You have properly completed the hardware installation.
- You have run the BIOS Setup Utility to check system configuration.

> **IMPORTANT:** To successfully install Windows 2000 on your system, PnP must be enabled in your system BIOS.

- You will be installing Windows® 2000 Operating System from the CD-ROM media.

> **IMPORTANT:** If you have the optional disk array controller preinstalled on your system, it was preconfigured at the factory. Refer to your system's *User's Guide* and to the *RAID Installation Guide* and the *Disk Array Controller Installation Guide and User's Manual* for additional information on this option card. If you need to change the RAID level from the factory setting, you must change the setting before installing the operating system.

Preparation

Before starting the installation procedure, you need to obtain certain information for use during the installation. The table below lists the information you need in advance for the installation. It is recommended that you obtain the information from your server administrator and record it in the table before starting.

After completing the installation, you might want to use the Windows 2000 Control Panel to configure additional devices or Windows 2000 services and facilities.

Item	Information Required	Enter Your Information Here
1	Name of the Windows 2000 user.	
2	Name of the licensed organization.	
3	Product Key number for Microsoft Windows 2000 Server Software. This number is on the Certificate of Authenticity included with your Windows 2000 Server Software.	
4	Name that you assign to the server.	
5	Obtain your network configuration information. For example, if network settings are to be customized: TCP/IP Configuration values such as IP address values, DNS and WINS address resolution facilities, DHCP Relay and Routing configuration values.	
6	The name of any Administrative Domain or Workgroup that this server is to be a member of.	

Installing Microsoft Windows® 2000 Operating System

Use the following procedure to set up and perform a clean Windows 2000 Operating System installation on your server.

1. Insert the Windows 2000 CD into the CD-ROM drive and boot your system by pressing CTRL+ALT+Delete.

> **IMPORTANT***:* Perform Steps 2 through 6 if a RAID controller is installed in your server; go to Step 7 if your server does not include a RAID controller.

2. While the message “Setup is inspecting your computer’s hardware configuration” or a solid blue background is displayed on the screen, press the F6 key.

> **IMPORTANT:** There is no visible indication on the screen when the F6 key has been pressed.

3. When the following message is displayed, press S.

   “Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter”. Currently, Setup will load support for the following mass storage devices.

4. When the following message is displayed, select “Other” and then press Enter.

   Select the SCSI Adapter your want from the following list, or select "Other" if you have a device support disk provided by an adapter manufacturer

5. Insert the "Windows 2000 OEM-DISK" diskette into the floppy drive, and press Enter. A list of mass storage devices is displayed.

6. Select the RAID disk array controller installed in your server from the list of mass storage devices.

7. Follow the messages on the screen to continue to install.

> **IMPORTANT:** Please consult the Microsoft Windows 2000 Installation Guide for more extensive installation procedures.
>
> For LAN adapter driver installation, *see Installing LAN Adapter Drivers* later in this appendix.

8. After installing Windows 2000, logon to the system using the administrator account or other account, which is a member of the Administrator’s group.

9. Insert the EXPRESSBUILDER CD and run the "Windows 2000 NEC Update Module" for the Express5800 120Rd-2 Server.

> **IMPORTANT:** If you change the configuration of the system (by adding or removing hardware or operating system software components), or repair the system, you must run the Windows 2000 NEC Update Module again.

Installing LAN Adapters

The following section includes special driver installation instructions for the Intel PRO/100+ LAN adapter used in your system.

Driver Installation for the Intel PRO/100+ LAN Adapter

The PRO/100+ driver is initially installed during the installation of Windows 2000 and upgraded when you run the "Windows 2000 NEC Update Module, see "Installing Microsoft Windows® 2000 Operating System" found earlier in this appendix. In order to utilize the PRO/100+ LAN adapter "teaming features," use the following procedure to install "PROSET II for Windows 2000."

1. Power on, start Windows 2000, and log on.
2. Insert the EXPRESSBUILDER CD into the CDROM drive. The "Start" Menu displays.
3. Select "Drivers and Utilities" from the "Start" Menu.
4. Select INTEL.
5. Select and run "PROSET II for Windows 2000."

Driver Installation for the ATI RAGE XL Display Adapter

To take full advantage of the on-board ATI RAGE XL display adapter, perform the following driver installation procedure:

1. Power on, start Windows 2000, and log on.
2. Insert the EXPRESSBUILDER CD into the CDROM drive. The "Start" Menu displays.
3. Select "Drivers and Utilities" from the "Start" Menu.
4. Select ATI.
5. Select and run "Rage XL Driver for Windows 2000."

Windows NT 4.0

This appendix contains supplemental instructions needed to install and configure hardware and software used with the Microsoft Operating System Windows NT Release 4.0. This information is intended to supplement the more detailed procedural documents available from Microsoft. This information is not intended to be the central source of installation and configuration information for your system. Read this entire appendix along with Microsoft's Windows NT 4.0 installation procedures before starting the installation process.

> **IMPORTANT**: Read the System Release Notes for the latest system information before attempting to install Windows NT 4.0 Operating System on your system.

Device Drivers

The drivers required for the devices listed in the table below are located on the EXPRESSBUILDER CD. To create the required diskettes, select “Tools” on the EXPRESSBUILDER CD. This table lists the required diskette labels.

> **IMPORTANT:** When creating the required diskettes from the EXPRESSBUILDER CD make sure you use the drivers required for the devices on your specific system.
>
> Always read the information in the release notes or inserts, included with any options for they supersede the information in this guide.

Device	Required Driver Media*
SCSI or SCSI RAID Controller	Windows NT 4.0 OEM - Disk #1*
Network Controller	Windows NT 4.0 OEM - Disk #2*
System Board	Windows NT 4.0 NEC Update Module**
Video	RAGE XL Driver for Windows NT 4.0**

*Diskette generated from the NEC EXPRESSBUILDER CDROM
**Run this application from the EXPRESSBUILDER CDROM; diskette not required

Configuring RAID

If you have a Disk Array Controller preinstalled on your system, it was preconfigured at the factory. Refer to your system's *User's Guide* and to the *AcceleRAID Installation Guide* and the *Disk Array Controller Installation Guide and User's Manual* for additional information on this option card. If you need to change the RAID level from the factory setting, you must change the setting before installing the operating system.

Installing Microsoft Windows® NT 4.0 Operating System

Use this procedure to install Windows NT 4.0 Operating System.

1. Insert the Windows NT CD into the CD-ROM drive and boot your system by powering on the system.
2. While the message "Setup is inspecting your computer's hardware configuration" or a solid blue background is being displayed on the screen, press the F6 key.

   IMPORTANT: There is no visible indication on the screen when the F6 key has been pressed.

3. When the following message is displayed, press S.

   "Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter". Currently, Setup will load support for the following mass storage devices.

4. When the following message is displayed, select "Other," then press Enter.

   Select the SCSI Adapter your want from the list, or select "Other" if you have a device support disk provided by an adapter manufacturer

5. Insert the "Windows NT 4.0 OEM-DISK #1" diskette into the floppy drive, and press Enter.
6. A list of mass storage devices is displayed.
   Select "Adaptec Ultra160/m Family PCI SCSI Controller", and press Enter.
7. When you are using a disk array controller, select the appropriate "device controller" from the above list of mass storage devices.
8. Follow the message on the screen to continue to install.

   IMPORTANT: Please consult the Microsoft Windows NT 4.0 Installation Guide for more extensive installation procedures.

   IMPORTANT: For LAN adapter driver installation, *see Installing LAN Adapter Drivers* later in this appendix.

9. After installing Windows NT, logon to the system using the administrator account or other account, which is a member of the Administrators group.
10. Insert the EXPRESSBUILDER CD and run the Windows NT 4.0 NEC Update Module.

> **IMPORTANT:** If you change the configuration of the system (by adding or removing hardware or operating system software components), or repair the system, you must run the system update again.

Installing LAN Adapter Drivers

The following section includes special driver installation instructions for LAN adapters used in your system.

Driver Installation for the Intel PRO/100+ LAN Adapter

The PRO/100+ driver will be installed during the installation of Windows NT, see “Installing Microsoft Windows® NT 4.0 Operating System” earlier in this appendix.

Use the following procedure to install the LAN adapter driver on your server:

1. During the Windows NT installation when the dialog box displaying the message "To have setup search for a Network Adapter, click Start Search button" opens. Click “Select from List”.
2. In the “Select Network Adapter” dialog box 1, Click “Have Disk”. The "Insert Disk" dialog box opens.
3. Insert the floppy disk named "Windows NT 4.0 OEM-DISK #2" into the floppy disk drive.
4. Enter "A:\I550PM" and click on [OK].
5. The "Select OEM Option" dialog box opens.
   Select "Intel(R) PRO Adapter" and click on [OK].
6. Click on [NEXT].
7. You may need to specify network information depending on the protocol you use. Follow the message on the screen to continue the Windows NT installation.

Driver Installation for the ATI RAGE XL Display Adapter

To take full advantage of the on-board ATI RAGE XL display adapter, perform the following driver installation procedure:

1. Power on, start Windows NT, and log on.
2. Insert the EXPRESSBUILDER CD into the CDROM drive. The “Start” Menu displays.
3. Select “Drivers and Utilities” from the “Start” Menu.
4. Select ATI.
5. Select and run “Rage XL Driver for Windows NT.”

Appendix D

Product Configuration Record Table

Use this table for information about setup and system environment change.

Hardware

Main Unit						
	Model name		Serial No.		Date Installed	
CPU						
#1	Clock		Serial No.		Date Installed	
#2	Clock		Serial No.		Date Installed	
Memory						
#1A, #1B	Size		Serial No.		Date Installed	
#2A, #2B	Size		Serial No.		Date Installed	
#3A, #3B	Size		Serial No.		Date Installed	
Monitor						
	Type		Model name		Serial No.	
					Date Installed	
Hard Disk						
ID0	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID1	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID2	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID3	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID4	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID5	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID8	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Flex Bay						
☐ CD-ROM / Floppy Disk Drive			☐ SCSI Hard Disk Drive			

D-2 Product Configuration Record Table

Backup Device						
Slot 1	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
PCI Slot #1B						
	Model name				Serial No.	
					Date Installed	
PCI Slot #2B						
	Model name				Serial No.	
					Date Installed	
PCI Slot #3B						
	Model name				Serial No.	
					Date Installed	
PCI Slot #1C						
	Model name				Serial No.	
					Date Installed	
PCI Slot #2C						
	Model name				Serial No.	
					Date Installed	
PCI Slot #3C						
	Model name				Serial No.	
					Date Installed	
Printer						
	Model name				Serial No.	
	Manufacturer				Date Installed	
Additional Cabinet for Disk						
	Model name				Serial No.	
					Date Installed	
External Peripheral Device 1						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 2						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 3						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 4						
	Model name				Serial No.	
	Manufacturer				Date Installed	

Software

Firmware version				
OS Application of RUR media	 ☐ Apply	Name: Name:		Version: Version:
File system	☐ FAT ☐ Others (	☐ HPFS	☐ NTFS)	
Bundled software installed				
Licensed software installed				
Application running when a failure occurred				

(This page is intentionally left blank.)

Glossary

A

AC
(Alternating Current) The type of current available in wall outlets. All computers must convert alternating current to direct current to operate. See also DC.

address
A label, name, or number that identifies a location in computer memory.

ASCII
(American Standard Code for Information Interchange) A standard number assigned to each of the alphanumeric characters and keyboard control code keys to enable the transfer of information between different types of computers and peripherals.

B

backplane slot
A connector on the backplane board in desktop computers and expansion boxes that allows you to install circuit cards.

backup
A copy of data for safe-keeping. The data is copied from computer memory or disk to a floppy disk, magnetic tape, or other media.

backup battery
The battery in your computer that maintains the real-time clock and the configuration information when the computer's power is removed.

base memory
An area of memory between 0 and 640 kilobytes.

baud rate
The speed with which data is transmitted during serial communication. The computer's operating system and software program must be configured for the same baud rate as the communication device, such as a serial printer. See also bps.

BIOS
(Basic Input/Output System) A program stored in flash EPROM or ROM that controls the keyboard, disk drives, video monitor, and other devices. See also flash EPROM, EPROM, and ROM.

bit
Derived from BInary digiT, a bit is the smallest unit of information a computer handles. See also byte.

BMC
(Baseboard Management Controller) Contains all of the server management functions. One major function of the BMC is to monitor system management events and log their occurrence in the System Event Log (SEL).

boot
The process of loading the operating system into memory.

bps
(bits per second) The number of bits transferred in one second during serial communication, such as modem transmission.

byte
A group of eight bits.

C

cache memory
A very fast, limited portion of RAM set aside for temporary storage of data for direct access by the microprocessor.

CD-ROM drive
(Compact Disk ROM drive) A type of mass storage device that reads information from a compact disk.

Centronics port
An industry standard parallel port. See also parallel port.

CGA
(Color Graphics Adapter) A type of video display system that provides low-resolution text and graphics on TTL monochrome and color monitors.

CMOS
(Complimentary Metal-Oxide Semiconductor) A type of low-power integrated circuit used in computers. See also TTL.

COM1 or COM2
The name you can assign a serial port to set or change its address. See also serial port.

command
An instruction that directs the computer to perform a particular operation.

configuration
The way in which a computer is set up to operate. Some configurable options include CPU speed, serial port designation, and memory allocation.

CPU
(Central Processing Unit) See microprocessor.

CRT
(Cathode-Ray Tube) The type of video display used in monitors for desktop computers.

D

DC
(Direct Current) The type of current available in the rechargeable battery packs used in portable computers. See also AC.

default
The factory setting your computer uses unless you instruct it otherwise. For example, when powering up, the computer will boot from the default drive.

density
The capacity of information (bytes) that can be packed onto a storage device, such as a floppy disk.

device driver
A software program that a computer must use to recognize and operate certain hardware, such as a mouse or a video monitor.

disk drive
A device that stores data on a hard or floppy disk. A floppy disk drive requires a floppy disk to be inserted; a hard disk drive has a permanently encased hard disk.

DOS
(Disk Operating System) See operating system.

DRAM
(Dynamic RAM) See RAM.

E

ECC
(Error Checking and Correction) A method of detecting and correcting errors.

EEPROM
(Electrically Erasable Programmable Read-Only Memory) A type of memory device that stores password and configuration information.

EGA
(Enhanced Graphics Adapter) A type of video display system that provides medium-resolution text and graphics on TTL monochrome, color, and enhanced color monitors.

EMP
The Emergency Management Port (EMP) provides an interface to the console manager. This interface allows remote server management via a modem or direct connection.

EMS
(Expanded Memory Specification) A method of accessing memory beyond the 640K limit of DOS by exchanging data in and out of main memory at high speeds. Some software requires EMS to operate.

EPROM
(Erasable Programmable Read-Only Memory) A type of memory device that is usually used to store system BIOS code. This code can be erased with ultraviolet light, but is not lost when the computer is powered off. See also flash EPROM and ROM.

expansion slot
See backplane slot.

extended memory
The protected memory above 1M that is directly accessible by the microprocessor through certain utilities and operating systems.

F

flash EPROM
A type of memory device that is usually used to store system BIOS code. This code can be replaced with updated code from a floppy disk, but is not lost when the computer is powered off. See also EPROM and ROM.

floppy disk drive
See disk drive.

format
The process used to organize a hard or floppy disk into sectors so it can accept data. Formatting destroys all previous data on the disk.

FRB (Fault Resilient Boot
A server management feature. FRB attempts to boot the system using the alternate processor or DIMM.

G

(Gigabyte)
1,073,741,824 bytes. See also byte.

H

hard disk drive
See disk drive.

hardware
The physical parts of your computer, including the keyboard, monitor, disk drives, cables, and circuit cards.

hot swap
A method used to insert or remove SCSI disk drives into or from an operating bus. This method is typically used in RAID subsystems. When used in non-RAID subsystems the operating system must typically be restarted.

I

IC
(Integrated Circuit) An electronic device that contains miniaturized circuitry.

IDE
(Integrated Drive Electronics) A type of hard disk drive with the control circuitry located inside the disk drive rather than on a drive controller card.

interface.
A connection between the computer and a peripheral device that enables them to exchange data. See also parallel port and serial port.

ISA
(Industry Standard Architecture) An industry standard for computers and circuit cards that transfer 16 bits of data at a time.

J

jumper
A small electrical connector used for configuration on some computer hardware.

K

(Kilobyte)
1,024 bytes. See also byte.

L

LAN
(Local Area Network) A group of computers linked together within a limited area to exchange information.

LCD
(Liquid Crystal Display) The type of video display used in portable computers.

LED
(Light-Emitting Diode) A small electronic device that glows when current flows through it.

LPT1 or LPT2
The name you can assign a parallel port to specify its address. See also parallel port.

LVD
Super-fast Ultra 2 SCSI Low Voltage Differential (LVD) Parallel SCSI Interface. A new SCSI interface that provides greater I/O bandwidth, device connectivity, data reliability, and longer cable lengths for Ultra2 SCSI hard disk drives. Note that in order to achieve LVD performance all devices including cable, controller, and drive must support LVD.

M

(Megabyte)
1,048,576 bytes. See also byte.

memory
The circuitry in your computer that stores data and programs. See also EMS, extended memory, RAM, and ROM.

microprocessor
The integrated circuit that processes data and controls the basic functions of the computer.

modem
A device used to exchange information with other computers over telephone or data lines.

module
A circuit board that plugs into a dedicated connector on the system board in your computer.

mouse
A small input device that you guide on a flat surface to control the cursor movement and operation of the computer when using certain software programs.

N

NVRAM
(Nonvolatile RAM) A type of RAM that retains its contents even after the computer is powered off. This memory stores EISA configuration information. See also RAM and SRAM.

O

operating system
A set of programs that provides the interface between other software programs and the computer.

P

parallel port
The connector on the back of your computer that allows the transfer of data between the computer and a parallel device, such as a parallel printer.

partition
The process of dividing the storage space on a hard disk into separate areas so that the operating system treats them as separate disk drives.

password
A security feature that prevents an unauthorized user from operating your computer. See also EEPROM.

PCI
Peripheral Component Interconnect. PCI is a high-performance peripherals I/O bus supporting data transfers of up to 528MB per second.

Pentium
A type of microprocessor, with a built-in math coprocessor, cache memory, and memory and bus controllers, that processes and communicates 32 bits of data at a time. This microprocessor also contains power management capabilities.

peripheral
A device connected to and controlled by the computer, such as an external disk drive or a printer.

pixel
The smallest element that is visible on a video display. The resolution of a video display system is measured in pixels.

PnP
(Plug-n-Play) Plug-and-play is the ability to plug a device into a computer and have the computer recognize that the device is there. The user doesn't have to tell the computer.

POST
Power-On-Self-Test.

R

RAM
(Random-Access Memory) A temporary storage area for data and programs. This type of memory must be periodically refreshed to maintain valid data, and is lost when the computer is powered off. See also NVRAM and SRAM.

real-time clock
The IC in your computer that maintains the time and date.

ROM
(Read-Only Memory) A type of memory device that usually is used to store system BIOS code. This code cannot be altered and is not lost when the computer is powered off. See also BIOS, EPROM, and flash EPROM.

RS-232C port
An industry standard serial port. See also serial port.

S

SAF-TE
(SCSI Accessed Fault Tolerant Enclosure) A specification for monitoring the state of the drives and enclosure environment (fan, power supply, temperature, etc.) using the SCSI bus to indicate faults.

save
To store information on a floppy disk, hard disk, magnetic tape, or some other permanent storage device.

SCSI
(Small Computer System Interface) An industry standard interface that provides high-speed access to tape drives, hard disk drives, and other peripheral devices.

SEL
(System Event Log) A record of system management events. The information stored includes the name of the event, the date and time the event occurred and data pertinent to the event. Event data may include POST error codes that reflect hardware errors or software conflicts within the system.

serial communication
Information sent sequentially, one bit at a time.

serial port
The connector on the back of your computer that allows the transfer of data between the computer and a serial device, such as a mouse, a modem, or a serial printer.

setup program
The program that you use to change the configuration of some ISA desktop and notebook computers. This program also contains information about the hardware in the computer.

software
Programs with specific functions, such as word processing, data base management, communications, and operating system.

SRAM
(Static RAM) A temporary storage area for data and programs. This type of memory does not need to be refreshed, but it is lost when the computer is powered off. See also NVRAM and RAM.

SVGA
(Super VGA) A type of video display system that provides very high-resolution text and graphics on analog color monitors.

system board
The main circuit board in your computer. It contains most of the connectors and ports.

T

tape drive
A type of storage device using magnetic tape.

TTL
(Transistor-Transistor Logic) A type of integrated circuit used in computers. See also CMOS.

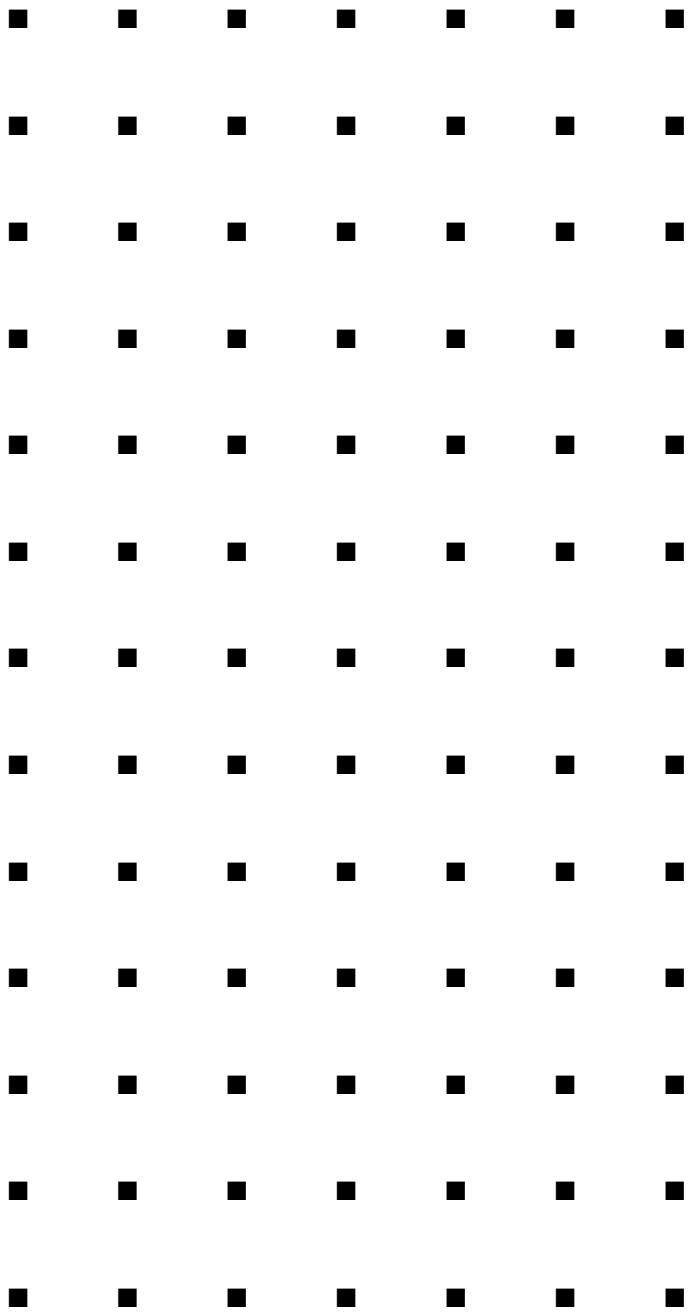
U

ultra 160/m SCSI
Ultra 160/m is a parallel SCSI interface based on Ultra3 SCSI technology. This interface features data transfer speeds up to 160MB/second (double-edge clocking), cyclical redundancy checking (CRC) providing higher levels of data reliability, and domain validation that detects the configuration of the SCSI bus and automatically tests and adjusts the SCSI bus transfer rate to optimize interoperability. Note that the Ultra 160/m uses the standard Ultra2 LVD cabling and termination, making it backward compatible for easy implementation.

V

VGA
(Video Graphics Array) A type of video display system that provides high-resolution text and graphics on analog color monitors.

(This page is intentionally left blank.)



456-01582-000